

FINAL TRAFFIC STUDY REPORT

Volume II

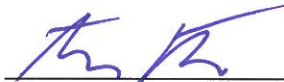
(Part 1 of 2)

for the

CENTENNIAL CORRIDOR PROJECT

on Route	<u>58 in Bakersfield</u>
between	<u>Cottonwood Road</u>
and	<u>Interstate 5</u>

APPROVAL RECOMMENDED:



Steven Milton, P.E. - Project Manager

APPROVED:

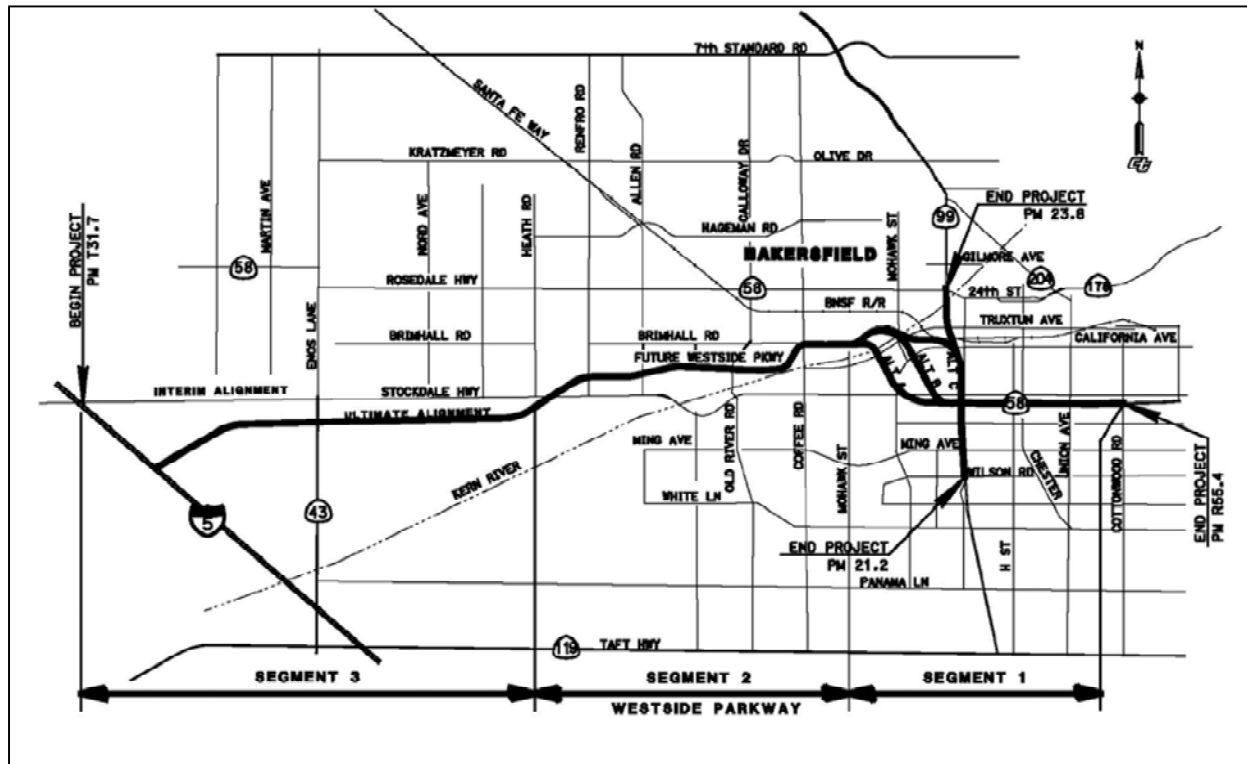


Sharri Bender Ehlert - District 6 Director

1/9/2013
Date

06-Ker-58, PM T31.7/R55.4
06-Ker-99, PM 21.2/23.8
Program Code 20.10.400.200
EA 06-48460
August 2012

VICINITY MAP



on Route 58 in Bakersfield
between Interstate 5
and Cottonwood Road

CONTENTS

VOLUME II

Part 1 of 2

Existing Conditions

No-Build Conditions

Alternative A

Part 2 of 2

Alternative B

Alternative C

STEAM 2.0 Model Output

EXISTING CONDITIONS



TECHNICAL MEMORANDUM

Date: December 3, 2010

To: Steve McDonald and Koko Widyatmoko, Caltrans
Steve Crouch, TRIP Corridor Manager
Curt Hatton, Caltrans Project Manager
Ravi Puttagunta, TRIP PMC (Parsons)
Jim Billings and Traci Gleason, HNTB

From: Rob Hananouchi, Bill Penney, and Fred Choa, Fehr & Peers

**Subject: Centennial Corridor Project–Existing Conditions Freeway Analysis Results
Updated Based on TRIP/Caltrans Comments**

RS08-2569

The purpose of this technical memorandum is to present the existing conditions freeway analysis results for the Centennial Corridor Project. Based on comments received from Caltrans and TRIP/Parsons (see Attachment 1) we have updated this formal submittal for the Centennial Corridor Project–Existing Conditions Freeway Analysis Results.

EXISTING TRAFFIC VOLUMES

The traffic counts for the majority of the freeway analysis locations were collected on October 28, 2008. The exceptions are the southbound SR 99 ramps at Ming Avenue (PM only), southbound SR 99 on-ramp at Airport Drive, and the Rosedale Highway/Buck Owens Boulevard interchange ramps. The first two locations were counted on November 20, 2008 and December 9 and 10, 2008. The last location uses data collected for the Rosedale Widening project on November 6 and 8, 2007.

The SR 58 mainline was counted between Real Road and SR 99. The SR 99 mainline was counted between Ming Avenue and SR 58. For both of these mainline segments, the morning peak hour started at 7:15 AM and the afternoon peak hour started at 4:45 PM.

Truck volumes were collected at all locations counted in 2008. For the purposes of the counts, trucks were considered to be all heavy vehicles with two or more axles including delivery vans, buses, and recreational vehicles.

ANALYSIS METHODOLOGY

The freeway study area includes State Route (SR) 99 from south of White Lane to north of Airport Road and SR 58 from SR 99 to east of Union Avenue (SR 204). Using the method described in the *Highway Capacity Manual* (pages 22-4 and 22-5), the freeway segments were divided into basic, merge, diverge, and weave analysis locations. We have analyzed the freeway basic, merge, and diverge sections according to the procedures in the *Highway Capacity Manual*. For weave sections, we used the Leisch Method as specified in Section 504.7 of the *Highway Design Manual*.

Under existing conditions, the traffic volumes, peak hour factors, and truck percentages are based on either field collected data or adjusted data that was approved by Caltrans and TRIP/parsons before being used in the freeway operations analysis. The adjusted peak hour factors and truck percentages were based on discussions at traffic focus meetings and

Distances for acceleration lanes (merge), deceleration lanes (diverge), and weaving lengths (weave) were determined from aerial photographs. For weave sections, the weaving volumes were developed using select link volumes from the KernCOG Regional Travel Demand Forecasting (TDF) Model. Figure 1 shows the freeway lane configurations under existing conditions, and Figure 2 shows the existing conditions traffic volumes.

The *Highway Capacity Manual* equations for freeway basic, merge, and diverge section analysis were incorporated in an Excel spreadsheet for ease of data entry and comparison among multiple locations. For comparison, we have provided HCS+ software results for three study locations in Attachment 4 (i.e. one basic, one merge, and one diverge section).

The only weave section under existing conditions is eastbound SR 58 between SR 99 and H Street. This segment is a "two-sided" weave. That is, the ramp from Real Road functions as a left-side on-ramp, and the H Street off-ramp is on the right side. So, traffic from Real Road exiting to H Street must weave across the mainline. The Leisch Method for a two-sided weave section is described in *Procedure for Analysis and Design of Weaving Sections* (Jack E. Leisch, October 1985), which also describes the one-sided weave analysis method presented in the *Highway Design Manual*.

The peak hour volumes used in the analysis of each ramp were determined by the peak hour at each individual ramp. The peak hour ramp volumes were used to balance the mainline volumes between interchanges.

The freeway mainline volumes between other interchanges were calculated by adding and/or subtracting the peak hour volumes at the on-ramps and off-ramps as described in the previous paragraph.

For the Rosedale Highway intersections, the truck volumes assumed for the Rosedale Widening intersection analysis were used. Truck percentages were calculated as the truck volume divided by total volume.

Peak hour factors (PHF) were calculated for each ramp and the mainline segment between interchanges based on field collected data and adjusted to ensure balanced traffic volumes. As a guideline, the PHF calculation was adjusted when necessary based on the following volume thresholds documented on page 5-4 of the Synchro 6 User Guide:

- Volume approach is greater than 2,000 vehicles per hour, PHF = 0.95
- Volume approach is between 1,000 to 2,000 vehicles per hour, PHF = 0.93
- Volume approach is between 500 to 1,000 vehicles per hour, PHF = 0.92
- Volume approach is between 200 to 500 vehicles per hour, PHF = 0.87
- Volume approach is between 100 to 200 vehicles per hour, PHF = 0.83
- Volume approach is between 1 to 100 vehicles per hour, PHF = 0.78

EXISTING CONDITIONS ANALYSIS RESULTS

Tables 1 through 4 below present the freeway analysis results for the study area under existing conditions. Attachment 2 lists the HCM basic, merge, and diverge calculations, and Attachment 3 provides the Leisch weave calculations.

For eastbound SR 58 (see Table 1), the section between Chester Avenue and Union Avenue generally has the highest peak hour volumes in the study area. As a result, the density is the highest in this section. During both the AM and PM peak hours, the Union Avenue off-ramp in this section operates at LOS E. All other analysis locations operate at LOS D during both the AM and PM peak hours, except for the basic mainline section between the Union Avenue off- and on-ramps which operates at LOS C during the AM peak hour.

Table 1 Freeway Mainline and Ramp Junction Level of Service Existing Conditions: SR 58 Eastbound								
Location	Lanes	Type	AM Peak Hour			PM Peak Hour		
			LOS	Density ¹	Speed ¹	LOS	Density ¹	Speed ¹
SR-99 to H St	3	Weave ²	D	-	-	D	-	-
H St Off-ramp to Chester Ave On-ramp	2	Basic	D	29.0	63.5	D	27.0	64.3
Chester Ave On-ramp	2	Merge	D	34.9	52.5	D	33.8	53.3
Chester Ave to Union Ave	2	Basic	D	34.3	60.3	D	33.7	60.7
Union Ave Off-ramp	2	Diverge	E	38.5	56.2	E	38.1	56.8
Union Ave Off-ramp to On-ramp	2	Basic	C	24.7	64.9	D	27.4	64.2
Union Ave SB On-ramp	2	Merge	D	29.1	55.4	D	31.8	54.3
Union Ave NB On-ramp	2	Merge	D	30.5	55.3	D	33.5	53.6
Union Ave to Cottonwood Rd	2	Basic	D	28.1	63.9	D	33.2	61.0
Notes: 1. Density is reported in vehicles per lane per mile, and speed is reported in miles per hour. Both were calculated per Highway Capacity Manual 2000. 2. Weave section analysis was performed using the Leisch Method, which does not provide density or speed estimates. Source: Fehr & Peers, 2010.								

For westbound SR 58 (see Table 2), all locations operate at LOS D or better except at the Brundage Lane off-ramp (AM peak hour) and Chester Avenue off-ramp (AM and PM peak hour) which operate at LOS E.

The majority of analysis locations on northbound SR 99 operate at LOS C or better (see Table 3). The following seven locations operate at LOS D.

- White Lane to Ming Avenue (AM peak hour)
- Ming Avenue on-ramp (AM peak hour)

- SR 58 off-ramp (PM peak hour)
- SR 58 on-ramp (AM peak hour)
- SR 58 to California Avenue (AM Peak Hour)
- California Avenue to Rosedale Highway (AM peak hour)
- Rosedale Highway off-ramp (PM peak hour)

In addition, five locations operate at LOS E or F during the AM and PM peak hour:

- White Lane eastbound on-ramp (AM peak hour)
- White Lane westbound on-ramp (AM peak hour)
- SR 58 off-ramp (AM peak hour)
- California Avenue off-ramp (AM peak hour)
- Rosedale Highway off-ramp (AM peak hour)

Table 2
Freeway Mainline and Ramp Junction Level of Service
Existing Conditions: SR 58 Westbound

Location	Lanes	Type	AM Peak Hour			PM Peak Hour		
			LOS	Density ¹	Speed ¹	LOS	Density ¹	Speed ¹
Cottonwood Rd to Union Ave	2	Basic	D	30.4	62.8	D	26.9	64.4
Brundage Ln Off-ramp	2	Diverge	E	35.7	50.9	D	32.7	51.3
Brundage Ln Off-ramp to On-ramp	2	Basic	C	24.8	64.9	C	23.6	65.0
Brundage Ln On-ramp	2	Merge	D	29.4	55.3	D	28.5	55.6
Union Ave SB On-ramp	2	Merge	D	31.3	54.4	D	31.0	54.5
Chester Ave Off-ramp	2	Diverge	E	35.2	57.0	E	35.0	57.1
Chester Ave Off-ramp to H St On-ramp	2	Basic	C	24.7	64.9	C	24.8	64.9
H St On-ramp	2	Merge	D	29.8	55.5	D	31.0	55.0
H St to SR-99	2	Basic	D	27.9	64.0	D	29.4	63.3
SR-99 NB Off-ramp	2	Diverge	D	33.6	58.2	D	34.8	58.4
SR-99 NB Off-ramp to SB Off-ramp	2	Basic	B	17.0	65.0	C	18.6	65.0
SR-99 SB Off-ramp	2	Diverge	C	22.2	49.9	C	24.1	49.5

Notes:

1. Density is reported in vehicles per lane per mile, and speed is reported in miles per hour. Both were calculated per Highway Capacity Manual 2000.

Source: Fehr & Peers, 2010.

**Table 3 – Freeway Mainline and Ramp Junction Level of Service
Existing Conditions: SR 99 Northbound**

Location	Lanes	Type	AM Peak Hour			PM Peak Hour		
			LOS	Density ¹	Speed ¹	LOS	Density ¹	Speed ¹
Panama Ln to White Ln	3	Basic	C	21.9	65.0	B	15.1	65.0
White Ln Off-ramp	3	Diverge	C	27.3	61.2	C	21.0	60.8
White Ln Off-ramp to On-ramp	3	Basic	C	20.6	65.0	B	13.1	65.0
White Ln EB On-ramp	3	Merge	E	35.6	53.9	C	25.0	58.1
White Ln WB On-ramp	3	Merge	E	35.3	54.0	C	23.9	58.6
White Ln to Ming Ave	3	Basic	D	34.9	59.8	C	21.5	65.0
Ming Ave Off-ramp	4	Diverge	C	27.6	59.4	C	20.4	59.6
Ming Ave Off-ramp to On-ramp	4	Basic	C	22.8	65.0	B	14.6	65.0
Ming Ave On-ramp	4	Merge	D	31.2	57.3	C	24.0	59.5
SR-58 Off-ramp	4	Diverge	E	40.6	61.4	D	30.0	62.4
SR-58 Off-ramp to Wible Rd On-ramp	4	Basic	C	21.0	65.0	B	13.6	65.0
Wible Rd On-ramp	4	Merge	C	23.3	59.0	B	17.7	60.2
SR-58 On-ramp	4	Merge	D	31.1	57.4	C	24.8	59.4
SR-58 to California Ave	4	Basic	D	28.8	63.6	C	20.9	65.0
California Ave Off-ramp	4	Diverge	E	36.7	60.9	C	27.0	62.4
California Ave Off-ramp to On-ramp	4	Basic	C	23.4	65.0	B	18.0	65.0
California Ave EB On-ramp	4	Merge	C	25.3	58.5	C	22.2	59.4
California Ave WB On-ramp	4	Merge	C	24.8	58.5	C	21.4	59.5
California Ave to Rosedale Hwy	4	Basic	D	26.5	64.5	C	22.1	65.0
Rosedale Hwy Off-ramp	4	Diverge	E	38.2	59.5	D	34.3	59.2
Buck Owens Blvd Off-ramp	4	Diverge	C	26.3	57.7	B	18.9	59.9
Buck Owens Blvd Off-ramp to On-ramp	4	Basic	B	16.5	65.0	B	13.6	65.0
Buck Owens Blvd On-ramp	4	Merge	B	18.6	60.0	B	17.8	60.2
Airport Dr Off-ramp	4	Diverge	C	27.9	59.2	C	23.8	60.3
Airport Dr to Golden State Ave	3	Basic	B	14.4	65.0	B	14.2	65.0

Notes:

1. Density is reported in vehicles per lane per mile, and speed is reported in miles per hour. Both were calculated per Highway Capacity Manual 2000.

Source: Fehr & Peers, 2010.

The majority of analysis locations on southbound SR 99 operate at LOS C or better (see Table 4). The following locations operate at LOS D.

- Airport Drive on-ramp (PM peak hour)
- Rosedale Highway off-ramp (PM peak hour)
- Rosedale Highway westbound on-ramp (PM peak hour)
- Rosedale Highway eastbound on-ramp (PM peak hour)
- Rosedale Highway to California Avenue (PM peak hour)
- California Avenue off-ramp (AM peak hour)
- California Avenue on-ramp (PM peak hour)
- California Avenue to SR 58 (PM peak hour)
- SR 58 off-ramp (AM peak hour)
- Ming Avenue to White Lane (PM peak hour)

In addition, the PM peak hour has three locations with LOS E or F conditions. The California Avenue off-ramp and the Ming Avenue off-ramp operate at LOS E due to high mainline and ramp volumes. The SR 58 off-ramp operates at LOS F because both the off-ramp volume and the mainline volume in the right two lanes exceed their capacity. The PM peak hour field observations found slower free-flow speeds at the, California Avenue off-ramp and SR 58 off-ramp. Additionally, traffic was observed to be queued onto the auxiliary lane at the White Lane off-ramp. This latter observation is not reflected in the analysis results since arterial operations on White Lane cause the queues.

Table 4 – Freeway Mainline and Ramp Junction Level of Service
Existing Conditions: SR 99 Southbound

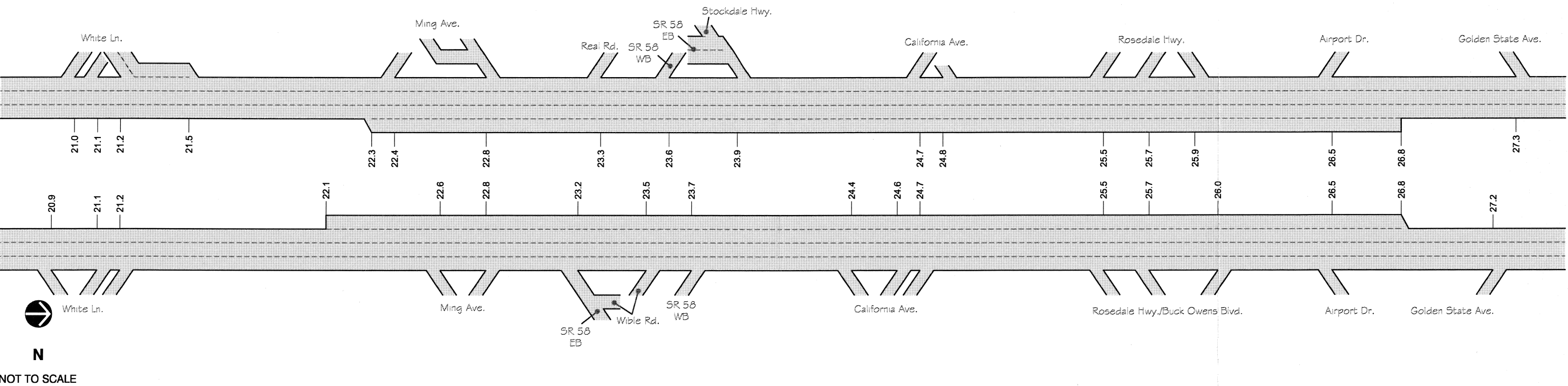
Location	Lanes	Type	AM Peak Hour			PM Peak Hour		
			LOS	Density ¹	Speed ¹	LOS	Density ¹	Speed ¹
Golden State Ave to Airport Dr	3	Basic	C	19.8	65.0	C	19.7	65.0
Airport Dr On-ramp	4	Merge	C	23.9	59.5	D	29.2	58.1
Airport Dr to Rosedale Hwy	4	Basic	C	19.4	65.0	C	22.6	65.0
Rosedale Hwy Off-ramp	4	Diverge	C	25.4	62.6	D	28.5	62.4
Rosedale Hwy Off-ramp to On-ramp	4	Basic	B	16.7	65.0	C	19.7	65.0
Rosedale Hwy WB On-ramp	4	Merge	C	21.9	59.5	D	28.9	57.9
Rosedale Hwy EB On-ramp	4	Merge	C	25.9	58.9	D	32.4	56.6
Rosedale Hwy to California Ave	4	Basic	C	23.4	65.0	D	30.5	62.7
California Ave Off-ramp	4	Diverge	D	31.8	61.2	E	37.1	61.1
California Ave Off-ramp to On-ramp	4	Basic	C	18.7	65.0	C	25.2	64.8
California Ave On-ramp	4	Merge	C	20.4	59.6	D	29.9	57.4
California Ave to SR-58	4	Basic	C	20.0	65.0	D	29.4	63.3
SR-58 Off-ramp	4	Diverge	D	31.0	61.9	F	-	-
SR-58 Off-ramp to On-ramp	4	Basic	B	13.2	65.0	C	20.1	65.0
SR-58 On-ramp	4	Merge	C	20.5	59.8	C	27.3	58.2
Real Rd On-ramp	4	Merge	B	18.3	60.1	C	24.6	58.6
Ming Ave Off-ramp	4	Diverge	C	24.7	62.1	E	36.2	60.0
Ming Ave Off-ramp to On-ramp	4	Basic	B	14.8	65.0	C	19.5	65.0
Ming Ave On-ramp	3	Merge	C	22.0	58.9	D	29.3	57.0
Ming Ave to White Ln	3	Basic	C	21.4	65.0	D	30.6	62.6
White Ln Off-ramp	3	Diverge	B	15.1	59.1	C	24.7	57.3
White Ln On-ramp to Off-ramp	3	Basic	B	13.5	65.0	B	17.7	65.0
White Ln WB On-ramp	3	Merge	B	16.1	59.6	C	20.1	58.9
White Ln EB On-ramp	3	Merge	B	16.2	59.8	C	20.0	59.2
White Ln to Panama Ln	3	Basic	B	14.7	65.0	C	19.1	65.0

Notes:

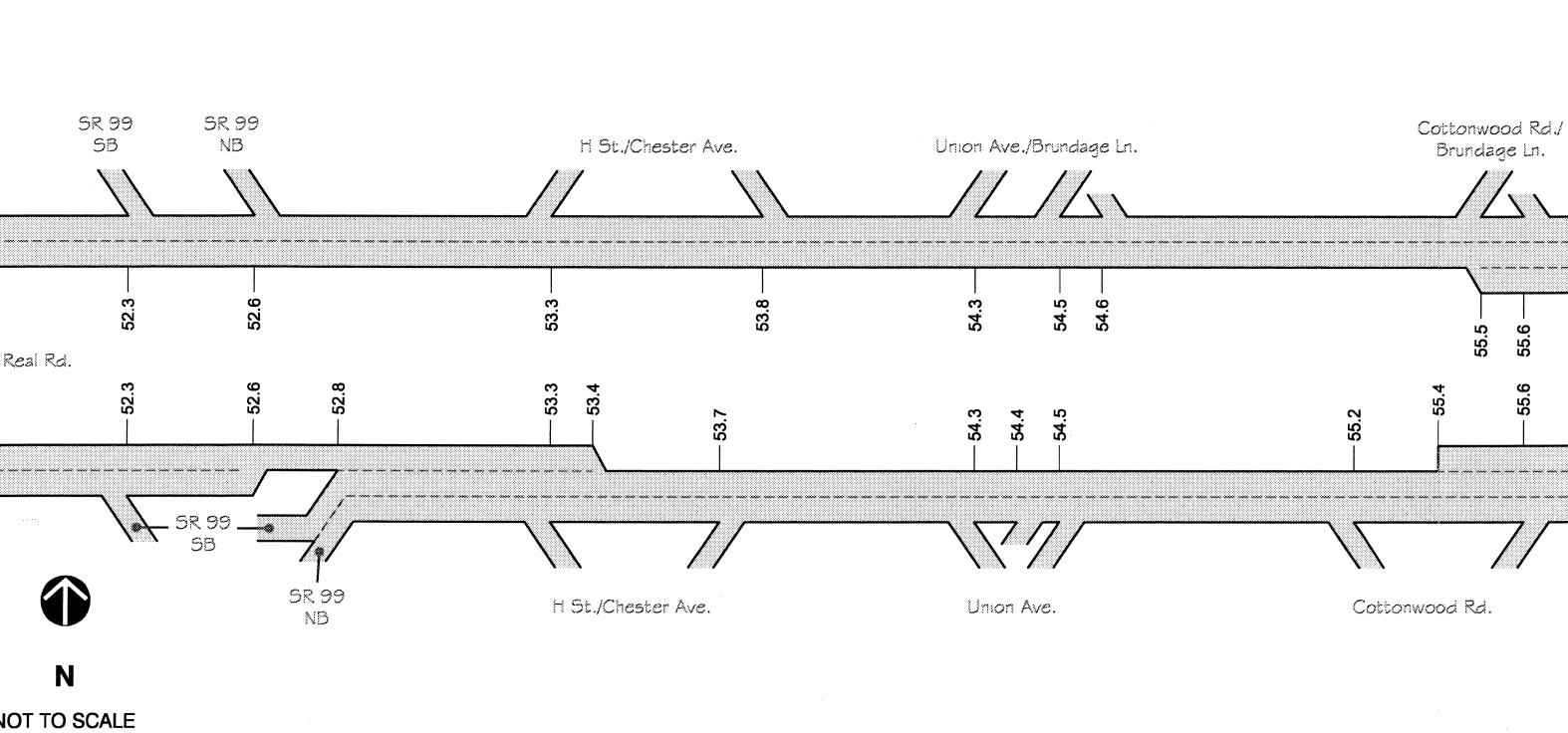
1. Density is reported in vehicles per lane per mile, and speed is reported in miles per hour. Both were calculated per Highway Capacity Manual 2000.

Source: Fehr & Peers, 2010.

State Route 99 - White Ln. to Golden State Ave.

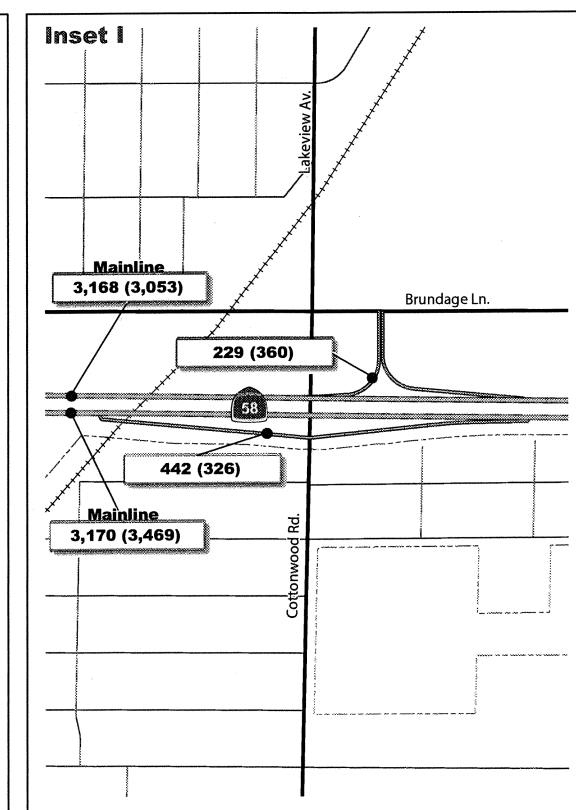
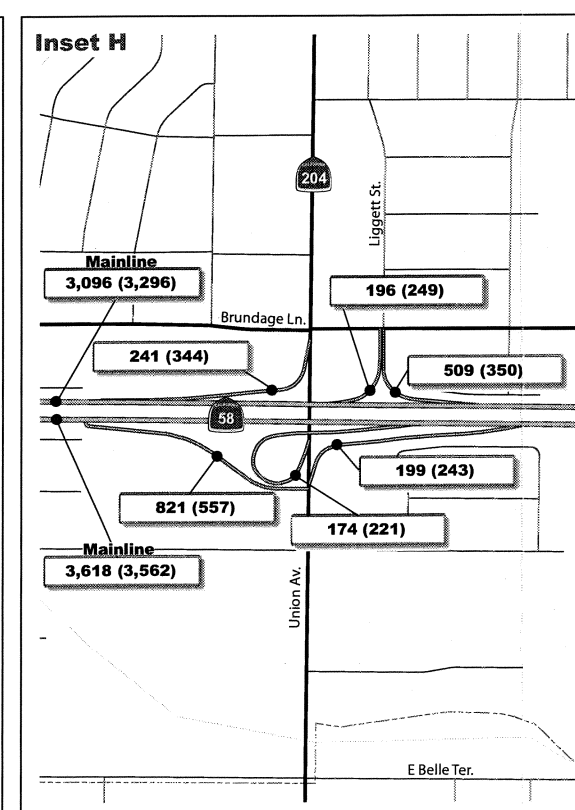
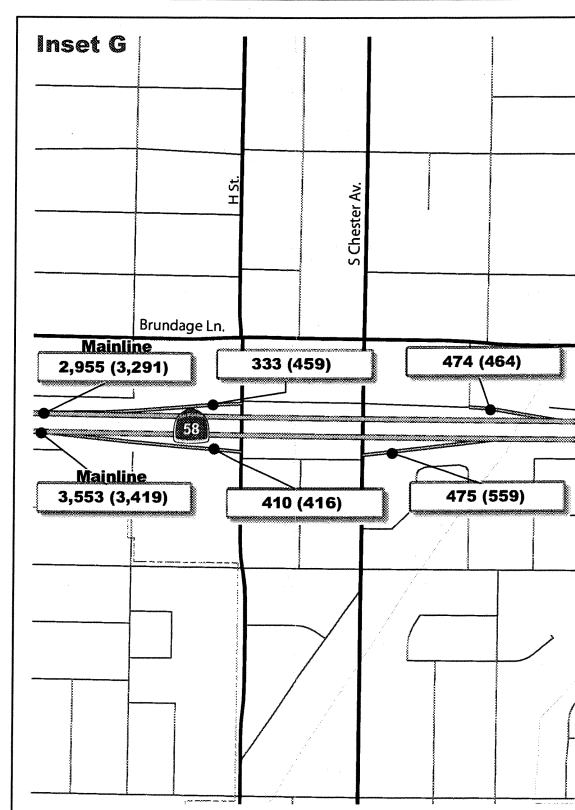
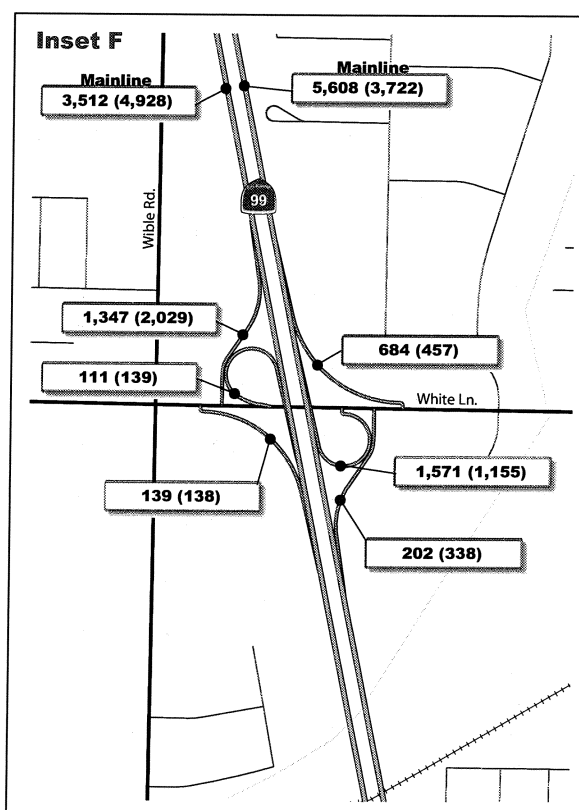
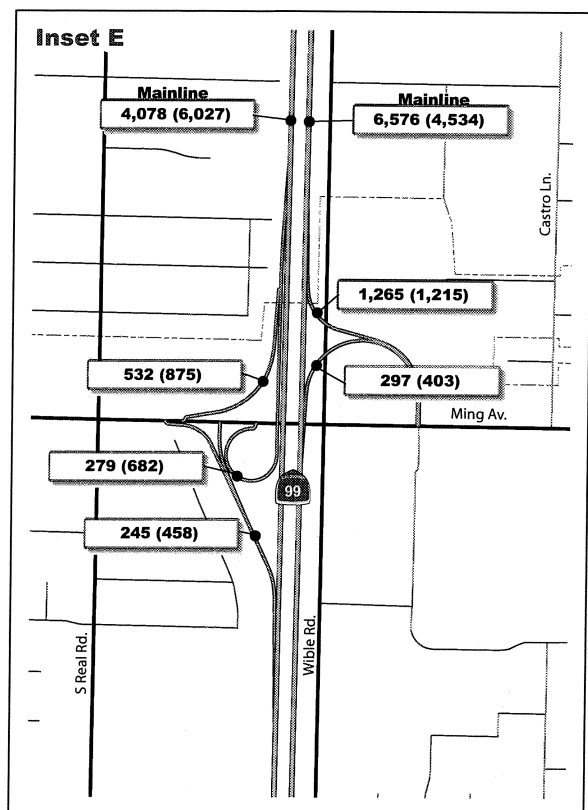
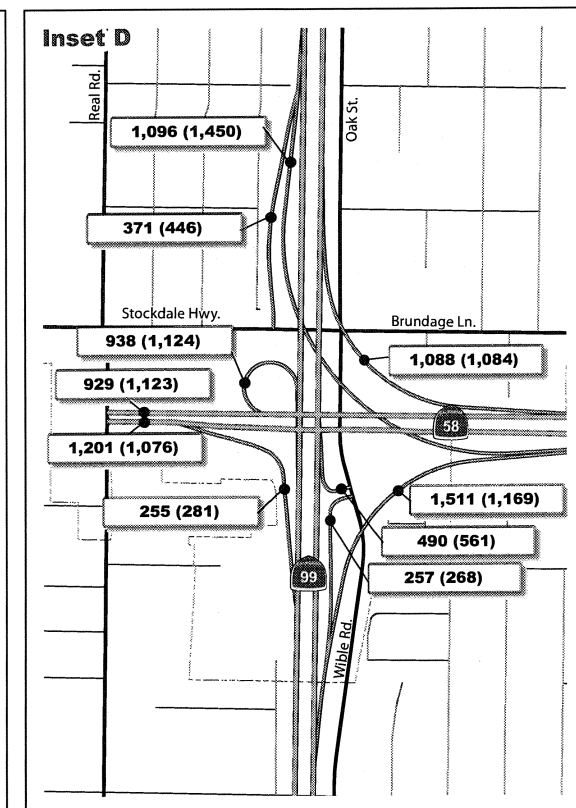
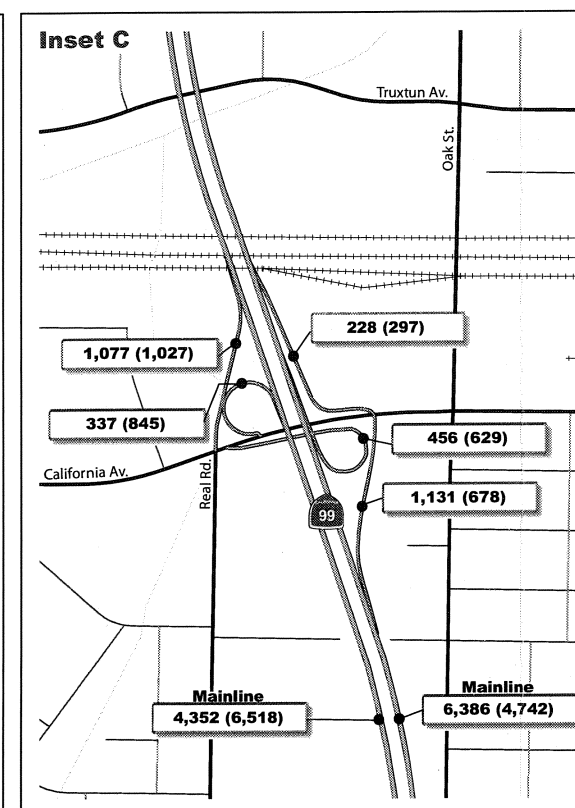
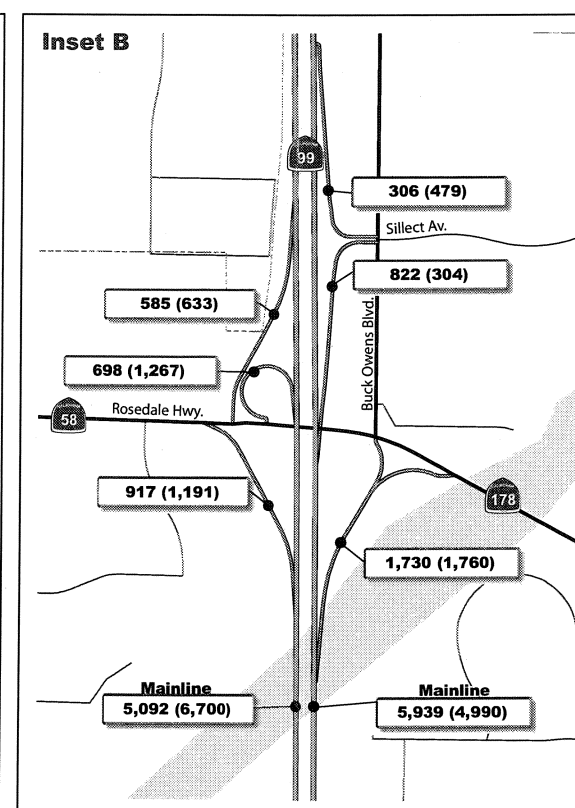
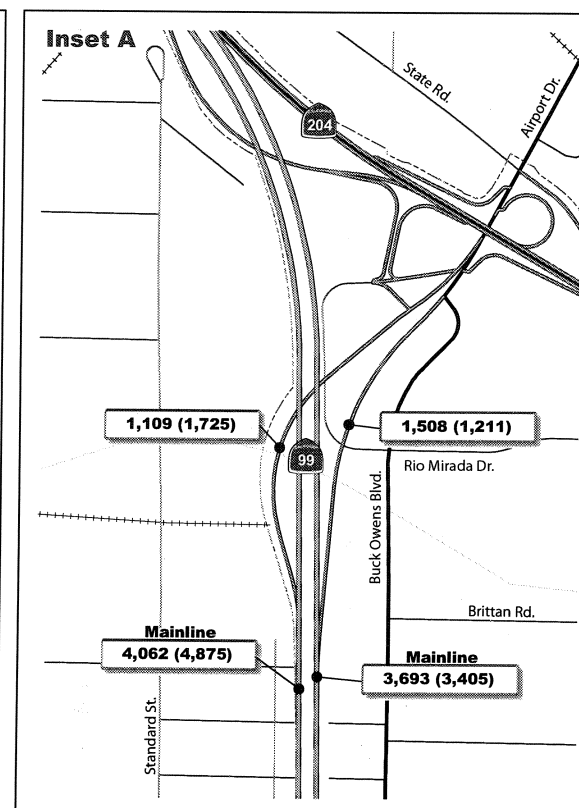
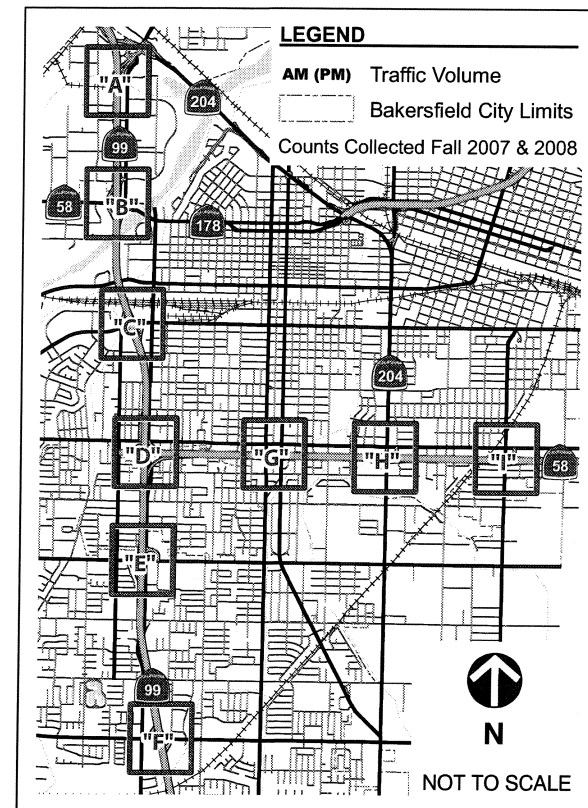


State Route 58 - Real Rd. to Cottonwood Rd.



LEGEND

6.0 Post-mile



ATTACHMENT 1 – RESPONSES TO COMMENTS

THOMAS ROADS IMPROVEMENT PROGRAM

ENVIRONMENTAL PROCESS COMMENT/RESOLUTION FORM



REPORT: Existing Conditions Freeway and Intersection Analysis		PROJECT: Centennial Corridor Project	
SUBMITTAL: <input type="checkbox"/> Screencheck <input type="checkbox"/> Preliminary <input checked="" type="checkbox"/> Draft <input type="checkbox"/> Final <input type="checkbox"/> Other:		CONSULTANT'S TRAFFIC MANAGER: Fred Choa, Fehr & Peers	
REVIEW TYPE: <input type="checkbox"/> City <input type="checkbox"/> County <input checked="" type="checkbox"/> Caltrans <input type="checkbox"/> HNTB <input type="checkbox"/> Other: Parsons		PHONE: (916)773-1900	EMAIL: f.choa@fehrandpeers.com
SUBMITTAL DATE: December 3, 2010	DUE DATE:	SCHEDULED JRT MEETING DATE:	

REVIEWER: Koko Widyatmoko, Caltrans	DISCIPLINE: Traffic Engineering
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No.	Page / Ref.	Reviewer's Comment	Initial Disp.	Consultants Response	Final Disp.	LS or NDC
1	1	The wording on the first sentence of second paragraph on the first page, under Analysis Methodology is improper, since not all the volume numbers are field collected data. The methodology on how volumes on other location are developed should be explained as well.	C	For locations where data was not field collected, a description will be included that explains how the volume numbers were developed.		
2	2	We suggest deleting the word "...due to problems with the counting equipment" on first paragraph on second page, under Existing Traffic Volumes. Instead, list the actual date that the data was collected on that particular location.	C	This sentence will be removed and will be replaced with the actual date when the data was collected for each location.		
3	3	All procedures and explanation on how the data/number acquired or developed should be mentioned under Analysis Methodology tab instead under Existing Traffic Volumes tab.	C	The discussion of the procedures and explanations on how the data was acquired or developed will be moved from the Existing Traffic Volumes section to the Analysis Methodology section.		
4	3	Peak Hour Factor should be acquired based on calculation and verified with field observation.	C	The discussion of the Peak Hour Factor was updated to discuss how they were calculated and adjusted when necessary.		

FINAL DISPOSITION CONCURRENCE: Signature indicates acknowledgement of concurrence to final dispositions ONLY and does not signify final approval of report.

REVIEWER SIGN & DATE: _____	CONSULTANT'S ENVIRO. MANAGER SIGN & DATE: _____
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CONSULTANTS INITIAL DISPOSITION CODES: C = Will Comply D = Discuss N = No Change A = Agency Action Required
TRIP FINAL DISPOSITION CODES: D = Done or Approved N/C = No Change Required
LS =Revise in Later Submittal **NDC** = Revise Immediately

ATTACHMENT 2 – HCM CALCULATIONS

HCM 2000
Basic Freeway Segments
Capacity Analysis

Jurisdiction Bakersfield, CA

Analysis Year Existing (2008)

Analyst BP

Agency or Company TRIP

Date 3.3.10

Project Description Centennial Corridor Study

General Information

Flow Rate Calculation

Speed Calculation

Results

Freeway/ Direction	From/To	Analysis Time Period	Volume (vph)	PHF	Lanes	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	Flow Rate v _P (pcphpl)	Measured FFS (mph)	S (mph)	Density, D (pcplpm)	Level of Service
B-2	SR-58 EB H St Off to Chester Ave On	AM	3,143	0.90	2	Level	11%	0%	1.5	1.2	0.948	1.00	1,842	65.0	63.5	29.0	D
B-3	SR-58 EB Chester Ave to Union Ave	AM	3,618	0.92	2	Level	10%	0%	1.5	1.2	0.952	1.00	2,065	65.0	60.3	34.3	D
B-4	SR-58 EB Union Ave Off to On	AM	2,797	0.92	2	Level	11%	0%	1.5	1.2	0.948	1.00	1,604	65.0	64.9	24.7	C
B-5	SR-58 EB Union Ave to Cottonwood Rd	AM	3,170	0.93	2	Level	11%	0%	1.5	1.2	0.948	1.00	1,798	65.0	63.9	28.1	D
B-6	SR-58 WB Cottonwood Rd to Union Ave	AM	3,168	0.88	2	Level	12%	0%	1.5	1.2	0.943	1.00	1,908	65.0	62.8	30.4	D
B-7	SR-58 WB Brundage Ln Off to On	AM	2,659	0.88	2	Level	13%	0%	1.5	1.2	0.939	1.00	1,609	65.0	64.9	24.8	C
B-8	SR-58 WB Chester Ave Off to H St On	AM	2,622	0.88	2	Level	15%	0%	1.5	1.2	0.930	1.00	1,602	65.0	64.9	24.7	C
B-9	SR-58 WB H St to SR-99	AM	2,955	0.88	2	Level	13%	0%	1.5	1.2	0.939	1.00	1,788	65.0	64.0	27.9	D
B-10	SR-58 WB SR-99 NB Off to SB Off	AM	1,867	0.88	2	Level	8%	0%	1.5	1.2	0.962	1.00	1,103	65.0	65.0	17.0	B
B-11	SR-99 NB Panama Ln to White Ln	AM	3,555	0.88	3	Level	11%	0%	1.5	1.2	0.948	1.00	1,421	65.0	65.0	21.9	C
B-12	SR-99 NB White Ln Off to On	AM	3,353	0.88	3	Level	11%	0%	1.5	1.2	0.948	1.00	1,340	65.0	65.0	20.6	C
B-13	SR-99 NB White Ln to Ming Ave	AM	5,608	0.94	3	Level	10%	0%	1.5	1.2	0.952	1.00	2,088	65.0	59.8	34.9	D
B-14	SR-99 NB Ming Ave Off to On	AM	5,311	0.94	4	Level	10%	0%	1.5	1.2	0.952	1.00	1,483	65.0	65.0	22.8	C
B-15	SR-99 NB SR-58 Off to Wible On	AM	4,808	0.92	4	Level	9%	0%	1.5	1.2	0.957	1.00	1,365	65.0	65.0	21.0	C
B-16	SR-99 NB SR-58 to California Ave	AM	6,386	0.92	4	Level	11%	0%	1.5	1.2	0.948	1.00	1,831	65.0	63.6	28.8	D
B-17	SR-99 NB California Ave Off to On	AM	5,255	0.92	4	Level	13%	0%	1.5	1.2	0.939	1.00	1,521	65.0	65.0	23.4	C
B-18	SR-99 NB California Ave to Rosedale Hwy	AM	5,939	0.92	4	Level	12%	0%	1.5	1.2	0.943	1.00	1,711	65.0	64.5	26.5	D
B-19	SR-99 NB Buck Owens Blvd Off to On	AM	3,387	0.86	4	Level	18%	0%	1.5	1.2	0.917	1.00	1,073	65.0	65.0	16.5	B
B-20	SR-99 NB Airport Dr Off to Golden State Blvd On	AM	2,185	0.88	3	Level	26%	0%	1.5	1.2	0.885	1.00	935	65.0	65.0	14.4	B
B-21	SR-99 SB Golden State Ave Off to Airport Dr On	AM	2,953	0.83	3	Level	17%	0%	1.5	1.2	0.922	1.00	1,287	65.0	65.0	19.8	C
B-22	SR-99 SB Airport Dr to Rosedale Hwy	AM	4,062	0.86	4	Level	14%	0%	1.5	1.2	0.935	1.00	1,263	65.0	65.0	19.4	C
B-23	SR-99 SB Rosedale Hwy Off to On	AM	3,477	0.86	4	Level	15%	0%	1.5	1.2	0.930	1.00	1,087	65.0	65.0	16.7	B
B-24	SR-99 SB Rosedale Hwy to California Ave	AM	5,092	0.89	4	Level	13%	0%	1.5	1.2	0.939	1.00	1,523	65.0	65.0	23.4	C
B-25	SR-99 SB California Ave Off to On	AM	4,015	0.89	4	Level	15%	0%	1.5	1.2	0.930	1.00	1,212	65.0	65.0	18.7	C
B-26	SR-99 SB California Ave to SR-58	AM	4,352	0.90	4	Level	15%	0%	1.5	1.2	0.930	1.00	1,300	65.0	65.0	20.0	C
B-27	SR-99 SB SR-58 Off to On	AM	2,885	0.90	4	Level	14%	0%	1.5	1.2	0.935	1.00	857	65.0	65.0	13.2	B
B-28	SR-99 SB Ming Ave Off to On	AM	3,267	0.91	4	Level	15%	0%	1.5	1.2	0.930	1.00	965	65.0	65.0	14.8	B
B-29	SR-99 SB Ming Ave to White Ln	AM	3,512	0.90	3	Level	14%	0%	1.5	1.2	0.935	1.00	1,392	65.0	65.0	21.4	C
B-30	SR-99 SB White Ln Off to On	AM	2,165	0.90	3	Level	19%	0%	1.5	1.2	0.913	1.00	878	65.0	65.0	13.5	B
B-31	SR-99 SB White Ln to Panama Ln	AM	2,415	0.92	3	Level	18%	0%	1.5	1.2	0.917	1.00	954	65.0	65.0	14.7	B

HCM 2000
Merge Ramp Junctions
Capacity Analysis

Jurisdiction Bakersfield, CA Agency or Company TRIP
 Analysis Year Existing (2008) Date 3.3.10
 Analyst BP Project Description Centennial Corridor Study

General Information

Freeway Data

Freeway Volume Adjustment

Freeway/ Direction	On-ramp	Analysis Time Period	Lanes	S _{FF} (mph)	V (vph)	PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	Flow Rate v _P (pcph)
M-1	SR-58 EB Chester Ave On	AM	2	65.0	3,143	0.90	Level	11%	0%	1.5	1.20	0.948	1.00	3,684
M-2	SR-58 EB Union Ave SB On	AM	2	65.0	2,797	0.92	Level	11%	0%	1.5	1.20	0.948	1.00	3,207
M-3	SR-58 EB Union Ave NB On	AM	2	65.0	2,971	0.92	Level	11%	0%	1.5	1.20	0.948	1.00	3,407
M-4	SR-58 WB Brundage Ln On	AM	2	65.0	2,659	0.88	Level	13%	0%	1.5	1.20	0.939	1.00	3,218
M-5	SR-58 WB Union Ave SB On	AM	2	65.0	2,855	0.88	Level	13%	0%	1.5	1.20	0.939	1.00	3,455
M-6	SR-58 WB H St On	AM	2	65.0	2,622	0.88	Level	15%	0%	1.5	1.20	0.930	1.00	3,203
M-7	SR-99 NB White Ln EB On	AM	3	65.0	3,353	0.88	Level	11%	0%	1.5	1.20	0.948	1.00	4,020
M-8	SR-99 NB White Ln WB On	AM	3	65.0	4,924	0.88	Level	10%	0%	1.5	1.20	0.952	1.00	5,875
M-9	SR-99 NB Ming Ave On	AM	4	65.0	5,311	0.94	Level	10%	0%	1.5	1.20	0.952	1.00	5,933
M-10	SR-99 NB Wible On	AM	4	65.0	4,808	0.92	Level	9%	0%	1.5	1.20	0.957	1.00	5,461
M-11	SR-99 NB SR-58 On	AM	4	65.0	5,298	0.92	Level	9%	0%	1.5	1.20	0.957	1.00	6,018
M-12	SR-99 NB California Ave EB On	AM	4	65.0	5,255	0.92	Level	13%	0%	1.5	1.20	0.939	1.00	6,083
M-13	SR-99 NB California Ave WB On	AM	4	65.0	5,711	0.92	Level	13%	0%	1.5	1.20	0.939	1.00	6,611
M-14	SR-99 NB Buck Owens Blvd On	AM	4	65.0	3,387	0.86	Level	18%	0%	1.5	1.20	0.917	1.00	4,293
M-15	SR-99 SB Airport Dr On	AM	4	65.0	2,953	0.83	Level	17%	0%	1.5	1.20	0.922	1.00	3,860
M-16	SR-99 SB Rosedale Hwy WB On	AM	4	65.0	3,477	0.86	Level	15%	0%	1.5	1.20	0.930	1.00	4,346
M-17	SR-99 SB Rosedale Hwy EB On	AM	4	65.0	4,175	0.86	Level	14%	0%	1.5	1.20	0.935	1.00	5,194
M-18	SR-99 SB California Ave On	AM	4	65.0	4,015	0.89	Level	15%	0%	1.5	1.20	0.930	1.00	4,850
M-19	SR-99 SB SR-58 On	AM	4	65.0	2,885	0.90	Level	14%	0%	1.5	1.20	0.935	1.00	3,430
M-20	SR-99 SB Real Rd On	AM	4	65.0	3,823	0.90	Level	13%	0%	1.5	1.20	0.939	1.00	4,524
M-21	SR-99 SB Ming Ave On	AM	3	65.0	3,267	0.91	Level	15%	0%	1.5	1.20	0.930	1.00	3,859
M-22	SR-99 SB White Ln WB On	AM	3	65.0	2,165	0.90	Level	19%	0%	1.5	1.20	0.913	1.00	2,634
M-23	SR-99 SB White Ln EB On	AM	3	65.0	2,276	0.90	Level	19%	0%	1.5	1.20	0.913	1.00	2,769

**HCM 2000
Merge Ramp Junctions
Capacity Analysis**

General Information

On-Ramp Data

On-Ramp Volume Adjustment

			On-Ramp Data						On-Ramp Volume Adjustment										
	Freeway/ Direction	On-ramp	Type	Lanes	S _{FR}	V _R	Accel Lane (ft)					Truck/						Flow Rate v _p (pcph)	
					(mph)	(vph)	L _{A1}	L _{A2}	L _{Aeff}	PHF	Terrain	Bus %	RV %	E _T	E _R	f _{HV}	f _p		
M-1	SR-58 EB	Chester Ave On	Right	1	45.0	475	540	540	0.88	Level	4%	0%	1.5	1.2	0.980	1.00	551		
M-2	SR-58 EB	Union Ave SB On	Right	1	25.0	174	480	480	0.81	Level	9%	0%	1.5	1.2	0.957	1.00	224		
M-3	SR-58 EB	Union Ave NB On	Right	1	45.0	199	540	540	0.86	Level	13%	0%	1.5	1.2	0.939	1.00	246		
M-4	SR-58 WB	Brundage Ln On	Right	1	25.0	196	480	480	0.82	Level	12%	0%	1.5	1.2	0.943	1.00	253		
M-5	SR-58 WB	Union Ave SB On	Right	1	25.0	241	540	540	0.84	Level	10%	0%	1.5	1.2	0.952	1.00	301		
M-6	SR-58 WB	H St On	Right	1	45.0	333	540	540	0.90	Level	4%	0%	1.5	1.2	0.980	1.00	377		
M-7	SR-99 NB	White Ln EB On	Right	1	25.0	1,571	360	360	0.86	Level	8%	0%	1.5	1.2	0.962	1.00	1,900		
M-8	SR-99 NB	White Ln WB On	Right	1	45.0	684	530	530	0.86	Level	6%	0%	1.5	1.2	0.971	1.00	819		
M-9	SR-99 NB	Ming Ave On	Right	1	45.0	1,265	560	560	0.88	Level	3%	0%	1.5	1.2	0.985	1.00	1,459		
M-10	SR-99 NB	Wible On	Right	1	25.0	490	550	550	0.86	Level	4%	0%	1.5	1.2	0.980	1.00	581		
M-11	SR-99 NB	SR-58 On	Right	1	55.0	1,088	560	560	0.86	Level	23%	0%	1.5	1.2	0.897	1.00	1,411		
M-12	SR-99 NB	California Ave EB On	Right	1	25.0	456	500	500	0.86	Level	5%	0%	1.5	1.2	0.976	1.00	543		
M-13	SR-99 NB	California Ave WB On	Right	1	45.0	228	540	540	0.84	Level	7%	0%	1.5	1.2	0.966	1.00	281		
M-14	SR-99 NB	Buck Owens Blvd On	Right	1	25.0	306	500	500	0.84	Level	13%	0%	1.5	1.2	0.939	1.00	388		
M-15	SR-99 SB	Airport Dr On	Right	1	45.0	1,109	500	500	0.88	Level	5%	0%	1.5	1.2	0.976	1.00	1,292		
M-16	SR-99 SB	Rosedale Hwy WB On	Right	1	25.0	698	540	540	0.86	Level	10%	0%	1.5	1.2	0.952	1.00	852		
M-17	SR-99 SB	Rosedale Hwy EB On	Right	1	45.0	917	630	630	0.86	Level	8%	0%	1.5	1.2	0.962	1.00	1,109		
M-18	SR-99 SB	California Ave On	Right	1	25.0	337	490	490	0.88	Level	3%	0%	1.5	1.2	0.985	1.00	389		
M-19	SR-99 SB	SR-58 On	Right	1	25.0	938	610	610	0.88	Level	9%	0%	1.5	1.2	0.957	1.00	1,114		
M-20	SR-99 SB	Real Rd On	Right	1	45.0	255	540	540	0.89	Level	2%	0%	1.5	1.2	0.990	1.00	289		
M-21	SR-99 SB	Ming Ave On	Right	1	45.0	245	550	550	0.88	Level	4%	0%	1.5	1.2	0.980	1.00	284		
M-22	SR-99 SB	White Ln WB On	Right	1	25.0	111	390	390	0.87	Level	9%	0%	1.5	1.2	0.957	1.00	133		
M-23	SR-99 SB	White Ln EB On	Right	1	45.0	139	520	520	0.87	Level	7%	0%	1.5	1.2	0.966	1.00	165		

HCM 2000
Merge Ramp Junctions
Capacity Analysis

General Information

Adjacent Upstream Ramp Data

Freeway/ Direction			On-ramp	Exists?	Distance	Volume (vph)	PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	Flow Rate v _p (pcph)
M-1	SR-58 EB	Chester Ave On		No											
M-2	SR-58 EB	Union Ave SB On		No											
M-3	SR-58 EB	Union Ave NB On		No											
M-4	SR-58 WB	Brundage Ln On		No											
M-5	SR-58 WB	Union Ave SB On		No											
M-6	SR-58 WB	H St On		No											
M-7	SR-99 NB	White Ln EB On		Off	1,250	202	0.87	Level	8%	0%	1.5	1.2	0.962	1.00	241
M-8	SR-99 NB	White Ln WB On		On	680	1,571	0.86	Level	8%	0%	1.5	1.2	0.962	1.00	1,900
M-9	SR-99 NB	Ming Ave On		No											
M-10	SR-99 NB	Wible On		No											
M-11	SR-99 NB	SR-58 On		No											
M-12	SR-99 NB	California Ave EB On		No											
M-13	SR-99 NB	California Ave WB On		No											
M-14	SR-99 NB	Buck Owens Blvd On		No											
M-15	SR-99 SB	Airport Dr On		No											
M-16	SR-99 SB	Rosedale Hwy WB On		No											
M-17	SR-99 SB	Rosedale Hwy EB On		No											
M-18	SR-99 SB	California Ave On		No											
M-19	SR-99 SB	SR-58 On		No											
M-20	SR-99 SB	Real Rd On		No											
M-21	SR-99 SB	Ming Ave On		Off	2,870	811	0.88	Level	3%	0%	1.5	1.2	0.985	1.00	935
M-22	SR-99 SB	White Ln WB On		Off	1,520	1,347	0.86	Level	5%	0%	1.5	1.2	0.976	1.00	1,605
M-23	SR-99 SB	White Ln EB On		On	600	111	0.87	Level	9%	0%	1.5	1.2	0.957	1.00	133

HCM 2000
Merge Ramp Junctions
Capacity Analysis

General Information

Adjacent Downstream Ramp Data

v₁₂ Estimation

Freeway/ Direction	On-ramp	Exists?	Distance	Volume		PHF	Terrain	Truck/ Bus %		RV %	E _T	E _R	f _{HV}	f _P	Flow Rate v _p (pcph)	L _{EQ}		P _{FM} Equations			P _{FM}	v ₁₂ (pcph)
																25-2	25-3	1	2	3		
M-1	SR-58 EB Chester Ave On	No																0.593			1.000	3,684
M-2	SR-58 EB Union Ave SB On	No																0.591			1.000	3,207
M-3	SR-58 EB Union Ave NB On	No																0.593			1.000	3,407
M-4	SR-58 WB Brundage Ln On	No																0.591			1.000	3,218
M-5	SR-58 WB Union Ave SB On	No																0.593			1.000	3,455
M-6	SR-58 WB H St On	No																0.593			1.000	3,203
M-7	SR-99 NB White Ln EB On	On	680	684	0.86	Level	6%		0%	1.5	1.2	0.971	1.00	819		332	5,531	0.588	0.724		0.588	2,362
M-8	SR-99 NB White Ln WB On	No														1,619		0.592			0.592	3,480
M-9	SR-99 NB Ming Ave On	No																0.593			0.174	1,033
M-10	SR-99 NB Wible On	No																0.593			0.390	2,132
M-11	SR-99 NB SR-58 On	No																0.593			0.155	933
M-12	SR-99 NB California Ave EB On	No																0.592			0.373	2,268
M-13	SR-99 NB California Ave WB On	No																0.593			0.316	2,092
M-14	SR-99 NB Buck Owens Blvd On	No																0.592			0.392	1,684
M-15	SR-99 SB Airport Dr On	No																0.592			0.180	696
M-16	SR-99 SB Rosedale Hwy WB On	No																0.593			0.352	1,530
M-17	SR-99 SB Rosedale Hwy EB On	No																0.595			0.235	1,222
M-18	SR-99 SB California Ave On	No																0.591			0.388	1,880
M-19	SR-99 SB SR-58 On	No																0.595			0.351	1,203
M-20	SR-99 SB Real Rd On	No																0.593			0.315	1,427
M-21	SR-99 SB Ming Ave On	No														1,082		0.593	0.850		0.593	2,288
M-22	SR-99 SB White Ln WB On	On	600	139	0.87	Level	7%		0%	1.5	1.2	0.966	1.00	165		-330	1,093	0.588	0.784		0.588	1,550
M-23	SR-99 SB White Ln EB On	No														810		0.592			0.592	1,639

HCM 2000
Merge Ramp Junctions
Capacity Analysis

General Information

Capacity Checks

Freeway/ Direction	On-ramp	V _{Fi} (pcph)	Max V _{Fi} (pcph)	LOS F?	V _{FO} (pcph)	Max V _{FO} (pcph)	LOS F?	V ₃ , V _{av34} (pcphpl)	V ₃ , V _{av34} > 2,700?	V ₃ , V _{av34} > 1.5*V _{12/2} ?	V _{12a} (pcph)	V _{R12a} (pcph)	Max V _{R12a} (pcph)	LOS F?
M-1	SR-58 EB Chester Ave On	3,684	4,800	No	4,235	4,800	No	0	No	No	3,684	4,235	4,600	No
M-2	SR-58 EB Union Ave SB On	3,207	4,800	No	3,432	4,800	No	0	No	No	3,207	3,432	4,600	No
M-3	SR-58 EB Union Ave NB On	3,407	4,800	No	3,653	4,800	No	0	No	No	3,407	3,653	4,600	No
M-4	SR-58 WB Brundage Ln On	3,218	4,800	No	3,471	4,800	No	0	No	No	3,218	3,471	4,600	No
M-5	SR-58 WB Union Ave SB On	3,455	4,800	No	3,756	4,800	No	0	No	No	3,455	3,756	4,600	No
M-6	SR-58 WB H St On	3,203	4,800	No	3,580	4,800	No	0	No	No	3,203	3,580	4,600	No
M-7	SR-99 NB White Ln EB On	4,020	7,200	No	5,920	7,200	No	1,658	No	No	2,362	4,262	4,600	No
M-8	SR-99 NB White Ln WB On	5,875	7,200	No	6,694	7,200	No	2,395	No	No	3,480	4,299	4,600	No
M-9	SR-99 NB Ming Ave On	5,933	9,600	No	7,392	9,600	No	2,450	No	Yes	2,373	3,832	4,600	No
M-10	SR-99 NB Wible On	5,461	9,600	No	6,042	9,600	No	1,664	No	Yes	2,185	2,766	4,600	No
M-11	SR-99 NB SR-58 On	6,018	9,600	No	7,428	9,600	No	2,543	No	Yes	2,407	3,818	4,600	No
M-12	SR-99 NB California Ave EB On	6,083	9,600	No	6,627	9,600	No	1,908	No	Yes	2,433	2,977	4,600	No
M-13	SR-99 NB California Ave WB On	6,611	9,600	No	6,892	9,600	No	2,259	No	Yes	2,644	2,925	4,600	No
M-14	SR-99 NB Buck Owens Blvd On	4,293	9,600	No	4,681	9,600	No	1,304	No	Yes	1,717	2,105	4,600	No
M-15	SR-99 SB Airport Dr On	3,860	9,600	No	5,152	9,600	No	1,582	No	Yes	1,544	2,836	4,600	No
M-16	SR-99 SB Rosedale Hwy WB On	4,346	9,600	No	5,198	9,600	No	1,408	No	Yes	1,739	2,591	4,600	No
M-17	SR-99 SB Rosedale Hwy EB On	5,194	9,600	No	6,303	9,600	No	1,986	No	Yes	2,078	3,187	4,600	No
M-18	SR-99 SB California Ave On	4,850	9,600	No	5,238	9,600	No	1,485	No	Yes	1,940	2,329	4,600	No
M-19	SR-99 SB SR-58 On	3,430	9,600	No	4,544	9,600	No	1,114	No	Yes	1,372	2,486	4,600	No
M-20	SR-99 SB Real Rd On	4,524	9,600	No	4,813	9,600	No	1,548	No	Yes	1,810	2,099	4,600	No
M-21	SR-99 SB Ming Ave On	3,859	7,200	No	4,143	7,200	No	1,571	No	No	2,288	2,572	4,600	No
M-22	SR-99 SB White Ln WB On	2,634	7,200	No	2,767	7,200	No	1,084	No	No	1,550	1,683	4,600	No
M-23	SR-99 SB White Ln EB On	2,769	7,200	No	2,934	7,200	No	1,130	No	No	1,639	1,805	4,600	No

**HCM 2000
Merge Ramp Junctions
Capacity Analysis**

General Information

Results

Speed Estimation

Freeway/ Direction	On-ramp	V_R (pcph)	Max V_R (pcph)	LOS F?	Density, D (pcplpm)	Level of Service	Int. Var. M_s	Inf. Area S_R (mph)	Out Lns. S_O (mph)	All vehs. S (mph)
M-1	SR-58 EB Chester Ave On	551	2,100	No	34.9	D	0.542	52.5	0.0	52.5
M-2	SR-58 EB Union Ave SB On	224	1,900	No	29.1	D	0.418	55.4	0.0	55.4
M-3	SR-58 EB Union Ave NB On	246	2,100	No	30.5	D	0.423	55.3	0.0	55.3
M-4	SR-58 WB Brundage Ln On	253	1,900	No	29.4	D	0.423	55.3	0.0	55.3
M-5	SR-58 WB Union Ave SB On	301	1,900	No	31.3	D	0.461	54.4	0.0	54.4
M-6	SR-58 WB H St On	377	2,100	No	29.8	D	0.412	55.5	0.0	55.5
M-7	SR-99 NB White Ln EB On	1,900	1,900	No	35.6	E	0.580	51.7	60.8	53.9
M-8	SR-99 NB White Ln WB On	819	2,100	No	35.3	E	0.561	52.1	57.9	54.0
M-9	SR-99 NB Ming Ave On	1,459	2,100	No	31.2	D	0.451	54.6	60.4	57.3
M-10	SR-99 NB Wible On	581	1,900	No	23.3	C	0.355	56.8	60.9	59.0
M-11	SR-99 NB SR-58 On	1,411	2,200	No	31.1	D	0.437	55.0	60.3	57.4
M-12	SR-99 NB California Ave EB On	543	1,900	No	25.3	C	0.373	56.4	60.2	58.5
M-13	SR-99 NB California Ave WB On	281	2,100	No	24.8	C	0.345	57.1	59.7	58.5
M-14	SR-99 NB Buck Owens Blvd On	388	1,900	No	18.6	B	0.328	57.5	62.2	60.0
M-15	SR-99 SB Airport Dr On	1,292	2,100	No	23.9	C	0.342	57.1	62.6	59.5
M-16	SR-99 SB Rosedale Hwy WB On	852	1,900	No	21.9	C	0.346	57.0	62.1	59.5
M-17	SR-99 SB Rosedale Hwy EB On	1,109	2,100	No	25.9	C	0.359	56.7	61.2	58.9
M-18	SR-99 SB California Ave On	389	1,900	No	20.4	C	0.337	57.3	61.6	59.6
M-19	SR-99 SB SR-58 On	1,114	1,900	No	20.5	C	0.337	57.2	63.1	59.8
M-20	SR-99 SB Real Rd On	289	2,100	No	18.3	B	0.304	58.0	61.9	60.1
M-21	SR-99 SB Ming Ave On	284	2,100	No	22.0	C	0.323	57.6	61.1	58.9
M-22	SR-99 SB White Ln WB On	133	1,900	No	16.1	B	0.322	57.6	62.9	59.6
M-23	SR-99 SB White Ln EB On	165	2,100	No	16.2	B	0.298	58.1	62.7	59.8

HCM 2000
Diverge Ramp Junctions
Capacity Analysis

Jurisdiction Bakersfield, CA Agency or Company TRIP
 Analysis Year Existing (2008) Date 3.3.10
 Analyst BP Project Description Centennial Corridor Study

General Information

Freeway Data

Freeway Volume Adjustment

Freeway/ Direction	Off-ramp	Analysis Time Period	Lanes	S _{FF} (mph)	V (vph)	PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	Flow Rate v _D (pcph)
D-2	SR-58 EB Union Ave Off	AM	2	65.0	3,618	0.92	Level	10%	0%	1.5	1.20	0.952	1.00	4,129
D-3	SR-58 WB Brundage Ln Off	AM	2	65.0	3,168	0.88	Level	12%	0%	1.5	1.20	0.943	1.00	3,816
D-4	SR-58 WB Chester Ave Off	AM	2	65.0	3,096	0.88	Level	13%	0%	1.5	1.20	0.939	1.00	3,747
D-5	SR-58 WB SR-99 NB Off	AM	2	65.0	2,955	0.88	Level	13%	0%	1.5	1.20	0.939	1.00	3,576
D-6	SR-58 WB SR-99 SB Off	AM	2	65.0	1,867	0.88	Level	8%	0%	1.5	1.20	0.962	1.00	2,206
D-7	SR-99 NB White Ln Off	AM	3	65.0	3,555	0.88	Level	11%	0%	1.5	1.20	0.948	1.00	4,262
D-8	SR-99 NB Ming Ave Off	AM	4	65.0	5,608	0.94	Level	10%	0%	1.5	1.20	0.952	1.00	6,264
D-9	SR-99 NB SR-58 Off	AM	4	65.0	6,576	0.93	Level	9%	0%	1.5	1.20	0.957	1.00	7,389
D-10	SR-99 NB California Ave Off	AM	4	65.0	6,386	0.92	Level	11%	0%	1.5	1.20	0.948	1.00	7,323
D-11	SR-99 NB Rosedale Hwy Off	AM	4	65.0	5,939	0.92	Level	12%	0%	1.5	1.20	0.943	1.00	6,843
D-12	SR-99 NB Buck Owens Blvd Off	AM	4	65.0	4,209	0.92	Level	15%	0%	1.5	1.20	0.930	1.00	4,918
D-13	SR-99 NB Airport Dr Off	AM	4	65.0	3,693	0.86	Level	17%	0%	1.5	1.20	0.922	1.00	4,659
D-14	SR-99 SB Rosedale Hwy Off	AM	4	65.0	4,062	0.86	Level	14%	0%	1.5	1.20	0.935	1.00	5,054
D-15	SR-99 SB California Ave Off	AM	4	65.0	5,092	0.89	Level	13%	0%	1.5	1.20	0.939	1.00	6,093
D-16	SR-99 SB SR-58 Off	AM	4	65.0	4,352	0.90	Level	15%	0%	1.5	1.20	0.930	1.00	5,198
D-17	SR-99 SB Ming Ave Off	AM	4	65.0	4,078	0.91	Level	12%	0%	1.5	1.20	0.943	1.00	4,750
D-18	SR-99 SB White Ln Off	AM	3	65.0	3,512	0.90	Level	14%	0%	1.5	1.20	0.935	1.00	4,175

HCM 2000
Diverge Ramp Junctions
Capacity Analysis

General Information

Off-Ramp Data

Off-Ramp Volume Adjustment

Freeway/ Direction			On-Ramp Data						On-Ramp Volume Adjustment									
			Type	Lanes	S _{FR} (mph)	V _R (vph)	Decel Lane (ft)			PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	Flow Rate V _P (pcph)
		Off-ramp					L _{D1}	L _{D2}	L _{Doff}									
D-2	SR-58 EB	Union Ave Off	Right	1	45.0	821	140		140	0.90	Level	4%	0%	1.5	1.2	0.980	1.00	930
D-3	SR-58 WB	Brundage Ln Off	Right	1	25.0	509	150		150	0.88	Level	8%	0%	1.5	1.2	0.962	1.00	602
D-4	SR-58 WB	Chester Ave Off	Right	1	45.0	474	140		140	0.86	Level	4%	0%	1.5	1.2	0.980	1.00	562
D-5	SR-58 WB	SR-99 NB Off	Right	1	55.0	1,088	160		160	0.86	Level	23%	0%	1.5	1.2	0.897	1.00	1,411
D-6	SR-58 WB	SR-99 SB Off	Right	1	25.0	938	110		110	0.88	Level	9%	0%	1.5	1.2	0.957	1.00	1,114
D-7	SR-99 NB	White Ln Off	Right	1	45.0	202	140		140	0.87	Level	8%	0%	1.5	1.2	0.962	1.00	241
D-8	SR-99 NB	Ming Ave Off	Right	1	25.0	297	200		200	0.88	Level	5%	0%	1.5	1.2	0.976	1.00	346
D-9	SR-99 NB	SR-58 Off	Right	1	55.0	1,768	140		140	0.90	Level	7%	0%	1.5	1.2	0.966	1.00	2,033
D-10	SR-99 NB	California Ave Off	Right	1	45.0	1,131	140		140	0.88	Level	2%	0%	1.5	1.2	0.990	1.00	1,298
D-11	SR-99 NB	Rosedale Hwy Off	Right	1	45.0	1,730	140		140	0.90	Level	5%	0%	1.5	1.2	0.976	1.00	1,970
D-12	SR-99 NB	Buck Owens Blvd Off	Right	1	25.0	822	140		140	0.84	Level	7%	0%	1.5	1.2	0.966	1.00	1,013
D-13	SR-99 NB	Airport Dr Off	Right	1	45.0	1,508	300		300	0.84	Level	4%	0%	1.5	1.2	0.980	1.00	1,831
D-14	SR-99 SB	Rosedale Hwy Off	Right	1	45.0	585	140		140	0.86	Level	8%	0%	1.5	1.2	0.962	1.00	707
D-15	SR-99 SB	California Ave Off	Right	1	45.0	1,077	140		140	0.88	Level	2%	0%	1.5	1.2	0.990	1.00	1,236
D-16	SR-99 SB	SR-58 Off	Right	1	55.0	1,467	160		160	0.88	Level	15%	0%	1.5	1.2	0.930	1.00	1,792
D-17	SR-99 SB	Ming Ave Off	Right	1	45.0	811	210		210	0.88	Level	3%	0%	1.5	1.2	0.985	1.00	935
D-18	SR-99 SB	White Ln Off	Right	2	45.0	1,347	140	1,150	1,430	0.86	Level	5%	0%	1.5	1.2	0.976	1.00	1,605

HCM 2000
Diverge Ramp Junctions
Capacity Analysis

General Information

Adjacent Upstream Ramp Data

Freeway/ Direction			Off-ramp		Exists?	Distance	Volume (vph)	PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	Flow Rate v _p (pcph)
D-2	SR-58 EB	Union Ave Off			No											
D-3	SR-58 WB	Brundage Ln Off			No											
D-4	SR-58 WB	Chester Ave Off			No											
D-5	SR-58 WB	SR-99 NB Off			No											
D-6	SR-58 WB	SR-99 SB Off			No											
D-7	SR-99 NB	White Ln Off			No											
D-8	SR-99 NB	Ming Ave Off			No											
D-9	SR-99 NB	SR-58 Off			No											
D-10	SR-99 NB	California Ave Off			No											
D-11	SR-99 NB	Rosedale Hwy Off			No											
D-12	SR-99 NB	Buck Owens Blvd Off			No											
D-13	SR-99 NB	Airport Dr Off			No											
D-14	SR-99 SB	Rosedale Hwy Off			No											
D-15	SR-99 SB	California Ave Off			No											
D-16	SR-99 SB	SR-58 Off			No											
D-17	SR-99 SB	Ming Ave Off			No											
D-18	SR-99 SB	White Ln Off			On	5,270	243	0.88	Level	4%	0%	1.5	1.2	0.980	1.00	282

HCM 2000
Diverge Ramp Junctions
Capacity Analysis

General Information

Adjacent Downstream Ramp Data

v₁₂ Estimation

Freeway/ Direction	Off-ramp	Exists?	Distance	Volume (vph)	PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	Flow Rate v _p (pcph)	L _{EQ}			v ₁₂ (pcph)
														25-13	25-14	P _{FD}	
D-2	SR-58 EB Union Ave Off	No														1.000	4,129
D-3	SR-58 WB Brundage Ln Off	No														1.000	3,816
D-4	SR-58 WB Chester Ave Off	No														1.000	3,747
D-5	SR-58 WB SR-99 NB Off	No														1.000	3,576
D-6	SR-58 WB SR-99 SB Off	No														1.000	2,206
D-7	SR-99 NB White Ln Off	On	1,250	1,571	0.86	Level	8%	0%	1.5	1.2	0.962	1.00	1,900	2,055		0.642	2,824
D-8	SR-99 NB Ming Ave Off	No														0.436	2,926
D-9	SR-99 NB SR-58 Off	No														0.436	4,368
D-10	SR-99 NB California Ave Off	No														0.436	3,925
D-11	SR-99 NB Rosedale Hwy Off	No														0.436	4,095
D-12	SR-99 NB Buck Owens Blvd Off	No														0.436	2,716
D-13	SR-99 NB Airport Dr Off	No														0.436	3,064
D-14	SR-99 SB Rosedale Hwy Off	No														0.436	2,602
D-15	SR-99 SB California Ave Off	No														0.436	3,354
D-16	SR-99 SB SR-58 Off	No														0.436	3,277
D-17	SR-99 SB Ming Ave Off	No														0.436	2,599
D-18	SR-99 SB White Ln Off	On	1,520	111	0.87	Level	9%	0%	1.5	1.2	0.957	1.00	133	6,256	314	0.450	2,762

HCM 2000
Diverge Ramp Junctions
Capacity Analysis

General Information

Capacity Checks

Freeway/ Direction			Off-ramp			V _{Fi} Max v _{Fi} (pcph) (pcph) LOS F?			V ₃ , V _{av34} V ₃ , V _{av34} V ₃ , V _{av34} (pcphpl) > 2,700? > 1.5*v ₁₂ /2?			V _{12a} Max v ₁₂ (pcph) (pcph) LOS F?			V _{FO} Max v _{FO} (pcph) (pcph) LOS F?		
D-2	SR-58 EB	Union Ave Off				4,129	4,800	No	0	No	No	4,129	4,400	No	3,199	4,800	No
D-3	SR-58 WB	Brundage Ln Off				3,816	4,800	No	0	No	No	3,816	4,400	No	3,214	4,800	No
D-4	SR-58 WB	Chester Ave Off				3,747	4,800	No	0	No	No	3,747	4,400	No	3,185	4,800	No
D-5	SR-58 WB	SR-99 NB Off				3,576	4,800	No	0	No	No	3,576	4,400	No	2,166	4,800	No
D-6	SR-58 WB	SR-99 SB Off				2,206	4,800	No	0	No	No	2,206	4,400	No	1,093	4,800	No
D-7	SR-99 NB	White Ln Off				4,262	7,200	No	1,438	No	No	2,824	4,400	No	4,020	7,200	No
D-8	SR-99 NB	Ming Ave Off				6,264	9,600	No	1,669	No	No	2,926	4,400	No	5,918	9,600	No
D-9	SR-99 NB	SR-58 Off				7,389	9,600	No	1,510	No	No	4,368	4,400	No	5,356	9,600	No
D-10	SR-99 NB	California Ave Off				7,323	9,600	No	1,699	No	No	3,925	4,400	No	6,025	9,600	No
D-11	SR-99 NB	Rosedale Hwy Off				6,843	9,600	No	1,374	No	No	4,095	4,400	No	4,872	9,600	No
D-12	SR-99 NB	Buck Owens Blvd Off				4,918	9,600	No	1,101	No	No	2,716	4,400	No	3,905	9,600	No
D-13	SR-99 NB	Airport Dr Off				4,659	9,600	No	798	No	No	3,064	4,400	No	2,828	9,600	No
D-14	SR-99 SB	Rosedale Hwy Off				5,054	9,600	No	1,226	No	No	2,602	4,400	No	4,346	9,600	No
D-15	SR-99 SB	California Ave Off				6,093	9,600	No	1,370	No	No	3,354	4,400	No	4,857	9,600	No
D-16	SR-99 SB	SR-58 Off				5,198	9,600	No	961	No	No	3,277	4,400	No	3,406	9,600	No
D-17	SR-99 SB	Ming Ave Off				4,750	9,600	No	1,076	No	No	2,599	4,400	No	3,815	9,600	No
D-18	SR-99 SB	White Ln Off				4,175	7,200	No	1,413	No	No	2,762	4,400	No	2,570	7,200	No

HCM 2000
Diverge Ramp Junctions
Capacity Analysis

General Information

Results

Speed Estimation

Freeway/ Direction	Off-ramp	V _R (pcph)	Max V _R (pcph)	LOS F?	Density, D (pcplpm)	Level of Service	Int. Var. D _s	Inf. Area S _R (mph)	Out Lns. S _O (mph)	All vehs. S (mph)
D-2	SR-58 EB Union Ave Off	930	2,100	No	38.5	E	0.382	56.2	0.0	56.2
D-3	SR-58 WB Brundage Ln Off	602	1,900	No	35.7	E	0.612	50.9	0.0	50.9
D-4	SR-58 WB Chester Ave Off	562	2,100	No	35.2	E	0.349	57.0	0.0	57.0
D-5	SR-58 WB SR-99 NB Off	1,411	2,200	No	33.6	D	0.295	58.2	0.0	58.2
D-6	SR-58 WB SR-99 SB Off	1,114	1,900	No	22.2	C	0.658	49.9	0.0	49.9
D-7	SR-99 NB White Ln Off	241	2,100	No	27.3	C	0.320	57.6	69.6	61.2
D-8	SR-99 NB Ming Ave Off	346	1,900	No	27.6	C	0.589	51.4	68.7	59.4
D-9	SR-99 NB SR-58 Off	2,033	2,200	No	40.6	E	0.351	56.9	69.3	61.4
D-10	SR-99 NB California Ave Off	1,298	2,100	No	36.7	E	0.415	55.5	68.6	60.9
D-11	SR-99 NB Rosedale Hwy Off	1,970	2,100	No	38.2	E	0.475	54.1	69.8	59.5
D-12	SR-99 NB Buck Owens Blvd Off	1,013	1,900	No	26.3	C	0.649	50.1	70.9	57.7
D-13	SR-99 NB Airport Dr Off	1,831	2,100	No	27.9	C	0.463	54.4	71.3	59.2
D-14	SR-99 SB Rosedale Hwy Off	707	2,100	No	25.4	C	0.362	56.7	70.4	62.6
D-15	SR-99 SB California Ave Off	1,236	2,100	No	31.8	D	0.409	55.6	69.9	61.2
D-16	SR-99 SB SR-58 Off	1,792	2,200	No	31.0	D	0.329	57.4	71.3	61.9
D-17	SR-99 SB Ming Ave Off	935	2,100	No	24.7	C	0.382	56.2	71.0	62.1
D-18	SR-99 SB White Ln Off	1,605	4,100	No	15.1	B	0.442	54.8	69.7	59.1

HCM 2000
Basic Freeway Segments
Capacity Analysis

Jurisdiction Bakersfield, CA
 Analysis Year Existing (2008)
 Analyst BP

Agency or Company TRIP
 Date 3.3.10
 Project Description Centennial Corridor Study

General Information

Flow Rate Calculation

Speed Calculation

Results

Freeway/ Direction	From/To	Analysis Time Period	Volume (vph)	PHF	Lanes	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	Flow Rate v _p (pcphpl)	Measured FFS (mph)	S (mph)	Density, D (pcplpm)	Level of Service
B-2	SR-58 EB H St Off to Chester Ave On	PM	3,003	0.92	2	Level	13%	0%	1.5	1.2	0.939	1.00	1,738	65.0	64.3	27.0	D
B-3	SR-58 EB Chester Ave to Union Ave	PM	3,562	0.92	2	Level	11%	0%	1.5	1.2	0.948	1.00	2,042	65.0	60.7	33.7	D
B-4	SR-58 EB Union Ave Off to On	PM	3,005	0.90	2	Level	11%	0%	1.5	1.2	0.948	1.00	1,761	65.0	64.2	27.4	D
B-5	SR-58 EB Union Ave to Cottonwood Rd	PM	3,469	0.90	2	Level	10%	0%	1.5	1.2	0.952	1.00	2,024	65.0	61.0	33.2	D
B-6	SR-58 WB Cottonwood Rd to Union Ave	PM	3,053	0.92	2	Level	9%	0%	1.5	1.2	0.957	1.00	1,734	65.0	64.4	26.9	D
B-7	SR-58 WB Brundage Ln Off to On	PM	2,703	0.92	2	Level	9%	0%	1.5	1.2	0.957	1.00	1,535	65.0	65.0	23.6	C
B-8	SR-58 WB Chester Ave Off to H St On	PM	2,832	0.92	2	Level	9%	0%	1.5	1.2	0.957	1.00	1,608	65.0	64.9	24.8	C
B-9	SR-58 WB H St to SR-99	PM	3,291	0.92	2	Level	8%	0%	1.5	1.2	0.962	1.00	1,860	65.0	63.3	29.4	D
B-10	SR-58 WB SR-99 NB Off to SB Off	PM	2,207	0.92	2	Level	2%	0%	1.5	1.2	0.990	1.00	1,211	65.0	65.0	18.6	C
B-11	SR-99 NB Panama Ln to White Ln	PM	2,448	0.90	3	Level	16%	0%	1.5	1.2	0.926	1.00	979	65.0	65.0	15.1	B
B-12	SR-99 NB White Ln Off to On	PM	2,110	0.90	3	Level	18%	0%	1.5	1.2	0.917	1.00	852	65.0	65.0	13.1	B
B-13	SR-99 NB White Ln to Ming Ave	PM	3,722	0.94	3	Level	12%	0%	1.5	1.2	0.943	1.00	1,399	65.0	65.0	21.5	C
B-14	SR-99 NB Ming Ave Off to On	PM	3,319	0.93	4	Level	13%	0%	1.5	1.2	0.939	1.00	950	65.0	65.0	14.6	B
B-15	SR-99 NB SR-58 Off to Wible On	PM	3,097	0.93	4	Level	12%	0%	1.5	1.2	0.943	1.00	882	65.0	65.0	13.6	B
B-16	SR-99 NB SR-58 to California Ave	PM	4,742	0.93	4	Level	13%	0%	1.5	1.2	0.939	1.00	1,358	65.0	65.0	20.9	C
B-17	SR-99 NB California Ave Off to On	PM	4,064	0.93	4	Level	14%	0%	1.5	1.2	0.935	1.00	1,169	65.0	65.0	18.0	B
B-18	SR-99 NB California Ave to Rosedale Hwy	PM	4,990	0.92	4	Level	12%	0%	1.5	1.2	0.943	1.00	1,437	65.0	65.0	22.1	C
B-19	SR-99 NB Buck Owens Blvd Off to On	PM	2,926	0.89	4	Level	15%	0%	1.5	1.2	0.930	1.00	884	65.0	65.0	13.6	B
B-20	SR-99 NB Airport Dr Off to Golden State Blvd On	PM	2,194	0.87	3	Level	20%	0%	1.5	1.2	0.909	1.00	925	65.0	65.0	14.2	B
B-21	SR-99 SB Golden State Ave Off to Airport Dr On	PM	3,150	0.89	3	Level	17%	0%	1.5	1.2	0.922	1.00	1,280	65.0	65.0	19.7	C
B-22	SR-99 SB Airport Dr to Rosedale Hwy	PM	4,875	0.88	4	Level	12%	0%	1.5	1.2	0.943	1.00	1,468	65.0	65.0	22.6	C
B-23	SR-99 SB Rosedale Hwy Off to On	PM	4,242	0.88	4	Level	12%	0%	1.5	1.2	0.943	1.00	1,277	65.0	65.0	19.7	C
B-24	SR-99 SB Rosedale Hwy to California Ave	PM	6,700	0.92	4	Level	10%	0%	1.5	1.2	0.952	1.00	1,912	65.0	62.7	30.5	D
B-25	SR-99 SB California Ave Off to On	PM	5,673	0.92	4	Level	12%	0%	1.5	1.2	0.943	1.00	1,634	65.0	64.8	25.2	C
B-26	SR-99 SB California Ave to SR-58	PM	6,518	0.92	4	Level	10%	0%	1.5	1.2	0.952	1.00	1,860	65.0	63.3	29.4	D
B-27	SR-99 SB SR-58 Off to On	PM	4,622	0.92	4	Level	8%	0%	1.5	1.2	0.962	1.00	1,306	65.0	65.0	20.1	C
B-28	SR-99 SB Ming Ave Off to On	PM	4,470	0.92	4	Level	9%	0%	1.5	1.2	0.957	1.00	1,269	65.0	65.0	19.5	C
B-29	SR-99 SB Ming Ave to White Ln	PM	4,928	0.89	3	Level	8%	0%	1.5	1.2	0.962	1.00	1,920	65.0	62.6	30.6	D
B-30	SR-99 SB White Ln Off to On	PM	2,899	0.89	3	Level	12%	0%	1.5	1.2	0.943	1.00	1,151	65.0	65.0	17.7	B
B-31	SR-99 SB White Ln to Panama Ln	PM	3,176	0.90	3	Level	11%	0%	1.5	1.2	0.948	1.00	1,241	65.0	65.0	19.1	C

HCM 2000
Merge Ramp Junctions
Capacity Analysis

Jurisdiction Bakersfield, CA Agency or Company TRIP
 Analysis Year Existing (2008) Date 3.3.10
 Analyst BP Project Description Centennial Corridor Study

General Information

Freeway Data

Freeway Volume Adjustment

	Freeway/ Direction		Analysis Time Period	S _{FF}		V		Truck/ Bus %		RV %	E _T	E _R	f _{HV}	f _p	Flow Rate v _p (pcph)
	On-ramp			Lanes	(mph)	(vph)	PHF	Terrain							
M-1	SR-58 EB	Chester Ave On	PM	2	65.0	3,003	0.92	Level	13%	0%	1.5	1.2	0.939	1.00	3,476
M-2	SR-58 EB	Union Ave SB On	PM	2	65.0	3,005	0.90	Level	11%	0%	1.5	1.2	0.948	1.00	3,523
M-3	SR-58 EB	Union Ave NB On	PM	2	65.0	3,226	0.90	Level	10%	0%	1.5	1.2	0.952	1.00	3,764
M-4	SR-58 WB	Brundage Ln On	PM	2	65.0	2,703	0.92	Level	9%	0%	1.5	1.2	0.957	1.00	3,070
M-5	SR-58 WB	Union Ave SB On	PM	2	65.0	2,952	0.92	Level	8%	0%	1.5	1.2	0.962	1.00	3,337
M-6	SR-58 WB	H St On	PM	2	65.0	2,832	0.92	Level	9%	0%	1.5	1.2	0.957	1.00	3,217
M-7	SR-99 NB	White Ln EB On	PM	3	65.0	2,110	0.90	Level	18%	0%	1.5	1.2	0.917	1.00	2,555
M-8	SR-99 NB	White Ln WB On	PM	3	65.0	3,265	0.90	Level	13%	0%	1.5	1.2	0.939	1.00	3,864
M-9	SR-99 NB	Ming Ave On	PM	4	65.0	3,319	0.93	Level	13%	0%	1.5	1.2	0.939	1.00	3,801
M-10	SR-99 NB	Wible On	PM	4	65.0	3,097	0.93	Level	12%	0%	1.5	1.2	0.943	1.00	3,530
M-11	SR-99 NB	SR-58 On	PM	4	65.0	3,658	0.93	Level	11%	0%	1.5	1.2	0.948	1.00	4,150
M-12	SR-99 NB	California Ave EB On	PM	4	65.0	4,064	0.93	Level	14%	0%	1.5	1.2	0.935	1.00	4,676
M-13	SR-99 NB	California Ave WB On	PM	4	65.0	4,693	0.93	Level	13%	0%	1.5	1.2	0.939	1.00	5,374
M-14	SR-99 NB	Buck Owens Blvd On	PM	4	65.0	2,926	0.89	Level	15%	0%	1.5	1.2	0.930	1.00	3,534
M-15	SR-99 SB	Airport Dr On	PM	4	65.0	3,150	0.89	Level	17%	0%	1.5	1.2	0.922	1.00	3,840
M-16	SR-99 SB	Rosedale Hwy WB On	PM	4	65.0	4,242	0.88	Level	12%	0%	1.5	1.2	0.943	1.00	5,110
M-17	SR-99 SB	Rosedale Hwy EB On	PM	4	65.0	5,509	0.88	Level	11%	0%	1.5	1.2	0.948	1.00	6,605
M-18	SR-99 SB	California Ave On	PM	4	65.0	5,673	0.92	Level	12%	0%	1.5	1.2	0.943	1.00	6,536
M-19	SR-99 SB	SR-58 On	PM	4	65.0	4,622	0.92	Level	8%	0%	1.5	1.2	0.962	1.00	5,225
M-20	SR-99 SB	Real Rd On	PM	4	65.0	5,746	0.92	Level	7%	0%	1.5	1.2	0.966	1.00	6,464
M-21	SR-99 SB	Ming Ave On	PM	3	65.0	4,470	0.92	Level	9%	0%	1.5	1.2	0.957	1.00	5,077
M-22	SR-99 SB	White Ln WB On	PM	3	65.0	2,899	0.89	Level	12%	0%	1.5	1.2	0.943	1.00	3,453
M-23	SR-99 SB	White Ln EB On	PM	3	65.0	3,038	0.89	Level	11%	0%	1.5	1.2	0.948	1.00	3,601

HCM 2000
Merge Ramp Junctions
Capacity Analysis

General Information			On-Ramp Data				On-Ramp Volume Adjustment										
Freeway/ Direction	On-ramp	Type	Lanes	S _{FR} (mph)	V _R (vph)	Accel Lane (ft)			PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	Flow Rate v _p (pcph)
M-1	SR-58 EB Chester Ave On	Right	1	45.0	559	540		540	0.90	Level	3%	0%	1.5	1.2	0.985	1.00	630
M-2	SR-58 EB Union Ave SB On	Right	1	25.0	221	480		480	0.91	Level	3%	0%	1.5	1.2	0.985	1.00	247
M-3	SR-58 EB Union Ave NB On	Right	1	45.0	243	540		540	0.91	Level	6%	0%	1.5	1.2	0.971	1.00	275
M-4	SR-58 WB Brundage Ln On	Right	1	25.0	249	480		480	0.90	Level	3%	0%	1.5	1.2	0.985	1.00	281
M-5	SR-58 WB Union Ave SB On	Right	1	25.0	344	540		540	0.90	Level	2%	0%	1.5	1.2	0.990	1.00	386
M-6	SR-58 WB H St On	Right	1	45.0	459	540		540	0.90	Level	2%	0%	1.5	1.2	0.990	1.00	515
M-7	SR-99 NB White Ln EB On	Right	1	25.0	1,155	360		360	0.86	Level	4%	0%	1.5	1.2	0.980	1.00	1,370
M-8	SR-99 NB White Ln WB On	Right	1	45.0	457	530		530	0.86	Level	1%	0%	1.5	1.2	0.995	1.00	534
M-9	SR-99 NB Ming Ave On	Right	1	45.0	1,215	560		560	0.88	Level	1%	0%	1.5	1.2	0.995	1.00	1,388
M-10	SR-99 NB Wible On	Right	1	25.0	561	550		550	0.90	Level	2%	0%	1.5	1.2	0.990	1.00	630
M-11	SR-99 NB SR-58 On	Right	1	55.0	1,084	560		560	0.88	Level	19%	0%	1.5	1.2	0.913	1.00	1,349
M-12	SR-99 NB California Ave EB On	Right	1	25.0	629	500		500	0.88	Level	1%	0%	1.5	1.2	0.995	1.00	718
M-13	SR-99 NB California Ave WB On	Right	1	45.0	297	540		540	0.86	Level	0%	0%	1.5	1.2	1.000	1.00	345
M-14	SR-99 NB Buck Owens Blvd On	Right	1	25.0	479	500		500	0.84	Level	10%	0%	1.5	1.2	0.952	1.00	599
M-15	SR-99 SB Airport Dr On	Right	1	45.0	1,725	500		500	0.86	Level	2%	0%	1.5	1.2	0.990	1.00	2,026
M-16	SR-99 SB Rosedale Hwy WB On	Right	1	25.0	1,267	540		540	0.88	Level	6%	0%	1.5	1.2	0.971	1.00	1,483
M-17	SR-99 SB Rosedale Hwy EB On	Right	1	45.0	1,191	630		630	0.88	Level	7%	0%	1.5	1.2	0.966	1.00	1,401
M-18	SR-99 SB California Ave On	Right	1	25.0	845	490		490	0.88	Level	1%	0%	1.5	1.2	0.995	1.00	965
M-19	SR-99 SB SR-58 On	Right	1	25.0	1,124	610		610	0.90	Level	3%	0%	1.5	1.2	0.985	1.00	1,268
M-20	SR-99 SB Real Rd On	Right	1	45.0	281	540		540	0.88	Level	1%	0%	1.5	1.2	0.995	1.00	321
M-21	SR-99 SB Ming Ave On	Right	1	45.0	458	550		550	0.88	Level	1%	0%	1.5	1.2	0.995	1.00	523
M-22	SR-99 SB White Ln WB On	Right	1	25.0	139	390		390	0.87	Level	1%	0%	1.5	1.2	0.995	1.00	161
M-23	SR-99 SB White Ln EB On	Right	1	45.0	138	520		520	0.86	Level	2%	0%	1.5	1.2	0.990	1.00	162

**HCM 2000
Merge Ramp Junctions
Capacity Analysis**

General Information

Adjacent Upstream Ramp Data

Freeway/ Direction	On-ramp	Exists?	Distance	Volume (vph)	PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	Flow Rate v _P (pcph)
M-1	SR-58 EB Chester Ave On	No											
M-2	SR-58 EB Union Ave SB On	No											
M-3	SR-58 EB Union Ave NB On	No											
M-4	SR-58 WB Brundage Ln On	No											
M-5	SR-58 WB Union Ave SB On	No											
M-6	SR-58 WB H St On	No											
M-7	SR-99 NB White Ln EB On	Off	1,250	338	0.90	Level	4%	0%	1.5	1.2	0.980	1.00	383
M-8	SR-99 NB White Ln WB On	On	680	1,155	0.86	Level	4%	0%	1.5	1.2	0.980	1.00	1,370
M-9	SR-99 NB Ming Ave On	No											
M-10	SR-99 NB Wible On	No											
M-11	SR-99 NB SR-58 On	No											
M-12	SR-99 NB California Ave EB On	No											
M-13	SR-99 NB California Ave WB On	No											
M-14	SR-99 NB Buck Owens Blvd On	No											
M-15	SR-99 SB Airport Dr On	No											
M-16	SR-99 SB Rosedale Hwy WB On	No											
M-17	SR-99 SB Rosedale Hwy EB On	No											
M-18	SR-99 SB California Ave On	No											
M-19	SR-99 SB SR-58 On	No											
M-20	SR-99 SB Real Rd On	No											
M-21	SR-99 SB Ming Ave On	Off	2,870	1,557	0.90	Level	1%	0%	1.5	1.2	0.995	1.00	1,739
M-22	SR-99 SB White Ln WB On	Off	1,520	2,029	0.88	Level	3%	0%	1.5	1.2	0.985	1.00	2,340
M-23	SR-99 SB White Ln EB On	On	600	139	0.87	Level	1%	0%	1.5	1.2	0.995	1.00	161

HCM 2000
Merge Ramp Junctions
Capacity Analysis

General Information			Adjacent Downstream Ramp Data											v ₁₂ Estimation						
Freeway/ Direction	On-ramp	Exists?	Distance	Volume (vph)	PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	Flow Rate v _p (pcph)	L _{EQ}		P _{FM} Equations			P _{FM}	v ₁₂ (pcph)
														25-2	25-3	1	2	3		
M-1	SR-58 EB Chester Ave On	No																	1.000	3,476
M-2	SR-58 EB Union Ave SB On	No																	1.000	3,523
M-3	SR-58 EB Union Ave NB On	No																	1.000	3,764
M-4	SR-58 WB Brundage Ln On	No																	1.000	3,070
M-5	SR-58 WB Union Ave SB On	No																	1.000	3,337
M-6	SR-58 WB H St On	No																	1.000	3,217
M-7	SR-99 NB White Ln EB On	On	680	457	0.86	Level	1%	0%	1.5	1.2	0.995	1.00	534	-95	3,606	0.588	0.751		0.588	1,502
M-8	SR-99 NB White Ln WB On	No												1,128		0.592			0.592	2,289
M-9	SR-99 NB Ming Ave On	No														0.593			0.183	696
M-10	SR-99 NB Wible On	No														0.593			0.384	1,357
M-11	SR-99 NB SR-58 On	No														0.593			0.163	675
M-12	SR-99 NB California Ave EB On	No														0.592			0.351	1,641
M-13	SR-99 NB California Ave WB On	No														0.593			0.308	1,658
M-14	SR-99 NB Buck Owens Blvd On	No														0.592			0.366	1,293
M-15	SR-99 SB Airport Dr On	No														0.592			0.088	340
M-16	SR-99 SB Rosedale Hwy WB On	No														0.593			0.273	1,396
M-17	SR-99 SB Rosedale Hwy EB On	No														0.595			0.199	1,313
M-18	SR-99 SB California Ave On	No														0.591			0.316	2,064
M-19	SR-99 SB SR-58 On	No														0.595			0.331	1,732
M-20	SR-99 SB Real Rd On	No														0.593			0.311	2,014
M-21	SR-99 SB Ming Ave On	No												1,394		0.593	0.831		0.593	3,010
M-22	SR-99 SB White Ln WB On	On	600	138	0.86	Level	2%	0%	1.5	1.2	0.990	1.00	162	-149	1,071	0.588	0.773		0.588	2,032
M-23	SR-99 SB White Ln EB On	No												988		0.592			0.592	2,132

HCM 2000
Merge Ramp Junctions
Capacity Analysis

General Information

Capacity Checks

Freeway/ Direction	On-ramp	V_{Fi} (pcph)	Max V_{Fi} (pcph)	LOS F?	V_{FO} (pcph)	Max V_{FO} (pcph)	LOS F?	V_{3i}, V_{av34} (pcphpl)	V_{3i}, V_{av34} > 2,700?	V_{3i}, V_{av34} > 1.5* $V_{12}/2$?	V_{12a} (pcph)	V_{R12a} (pcph)	Max V_{R12a} (pcph)	LOS F?
M-1	SR-58 EB Chester Ave On	3,476	4,700	No	4,107	4,700	No	0	No	No	3,476	4,107	4,600	No
M-2	SR-58 EB Union Ave SB On	3,523	4,700	No	3,769	4,700	No	0	No	No	3,523	3,769	4,600	No
M-3	SR-58 EB Union Ave NB On	3,764	4,700	No	4,039	4,700	No	0	No	No	3,764	4,039	4,600	No
M-4	SR-58 WB Brundage Ln On	3,070	4,700	No	3,351	4,700	No	0	No	No	3,070	3,351	4,600	No
M-5	SR-58 WB Union Ave SB On	3,337	4,700	No	3,723	4,700	No	0	No	No	3,337	3,723	4,600	No
M-6	SR-58 WB H St On	3,217	4,700	No	3,732	4,700	No	0	No	No	3,217	3,732	4,600	No
M-7	SR-99 NB White Ln EB On	2,555	7,050	No	3,925	7,050	No	1,054	No	No	1,502	2,871	4,600	No
M-8	SR-99 NB White Ln WB On	3,864	7,050	No	4,398	7,050	No	1,575	No	No	2,289	2,823	4,600	No
M-9	SR-99 NB Ming Ave On	3,801	9,400	No	5,188	9,400	No	1,552	No	Yes	1,520	2,908	4,600	No
M-10	SR-99 NB Wible On	3,530	9,400	No	4,159	9,400	No	1,087	No	Yes	1,412	2,042	4,600	No
M-11	SR-99 NB SR-58 On	4,150	9,400	No	5,499	9,400	No	1,737	No	Yes	1,660	3,009	4,600	No
M-12	SR-99 NB California Ave EB On	4,676	9,400	No	5,394	9,400	No	1,517	No	Yes	1,870	2,589	4,600	No
M-13	SR-99 NB California Ave WB On	5,374	9,400	No	5,720	9,400	No	1,858	No	Yes	2,150	2,495	4,600	No
M-14	SR-99 NB Buck Owens Blvd On	3,534	9,400	No	4,133	9,400	No	1,120	No	Yes	1,414	2,012	4,600	No
M-15	SR-99 SB Airport Dr On	3,840	9,400	No	5,866	9,400	No	1,750	No	Yes	1,536	3,562	4,600	No
M-16	SR-99 SB Rosedale Hwy WB On	5,110	9,400	No	6,593	9,400	No	1,857	No	Yes	2,044	3,527	4,600	No
M-17	SR-99 SB Rosedale Hwy EB On	6,605	9,400	No	8,005	9,400	No	2,646	No	Yes	2,642	4,043	4,600	No
M-18	SR-99 SB California Ave On	6,536	9,400	No	7,501	9,400	No	2,236	No	Yes	2,615	3,580	4,600	No
M-19	SR-99 SB SR-58 On	5,225	9,400	No	6,492	9,400	No	1,747	No	Yes	2,090	3,358	4,600	No
M-20	SR-99 SB Real Rd On	6,464	9,400	No	6,785	9,400	No	2,225	No	Yes	2,586	2,907	4,600	No
M-21	SR-99 SB Ming Ave On	5,077	7,050	No	5,600	7,050	No	2,067	No	No	3,010	3,533	4,600	No
M-22	SR-99 SB White Ln WB On	3,453	7,050	No	3,613	7,050	No	1,421	No	No	2,032	2,192	4,600	No
M-23	SR-99 SB White Ln EB On	3,601	7,050	No	3,763	7,050	No	1,469	No	No	2,132	2,294	4,600	No

HCM 2000
Merge Ramp Junctions
Capacity Analysis

General Information					Results		Speed Estimation			
Freeway/ Direction	On-ramp	v_R (pcph)	Max v_R (pcph)	LOS F?	Density, D (pcplpm)	Level of Service	Int. Var. M_S	Inf. Area S_R (mph)	Out Lns. S_O (mph)	All vehs. S (mph)
M-1	SR-58 EB Chester Ave On	630	2,100	No	33.8	D	0.509	53.3	0.0	53.3
M-2	SR-58 EB Union Ave SB On	247	1,900	No	31.8	D	0.466	54.3	0.0	54.3
M-3	SR-58 EB Union Ave NB On	275	2,100	No	33.5	D	0.494	53.6	0.0	53.6
M-4	SR-58 WB Brundage Ln On	281	1,900	No	28.5	D	0.408	55.6	0.0	55.6
M-5	SR-58 WB Union Ave SB On	386	1,900	No	31.0	D	0.455	54.5	0.0	54.5
M-6	SR-58 WB H St On	515	2,100	No	31.0	D	0.435	55.0	0.0	55.0
M-7	SR-99 NB White Ln EB On	1,370	1,900	No	25.0	C	0.372	56.4	63.0	58.1
M-8	SR-99 NB White Ln WB On	534	2,100	No	23.9	C	0.339	57.2	61.1	58.6
M-9	SR-99 NB Ming Ave On	1,388	2,100	No	24.0	C	0.342	57.1	62.7	59.5
M-10	SR-99 NB Wible On	630	1,900	No	17.7	B	0.324	57.6	63.0	60.2
M-11	SR-99 NB SR-58 On	1,349	2,200	No	24.8	C	0.338	57.2	62.3	59.4
M-12	SR-99 NB California Ave EB On	718	1,900	No	22.2	C	0.348	57.0	61.8	59.4
M-13	SR-99 NB California Ave WB On	345	2,100	No	21.4	C	0.320	57.6	61.0	59.5
M-14	SR-99 NB Buck Owens Blvd On	599	1,900	No	17.8	B	0.325	57.5	63.0	60.2
M-15	SR-99 SB Airport Dr On	2,026	2,100	No	29.2	D	0.413	55.5	62.7	58.1
M-16	SR-99 SB Rosedale Hwy WB On	1,483	1,900	No	28.9	D	0.427	55.2	61.3	57.9
M-17	SR-99 SB Rosedale Hwy EB On	1,401	2,100	No	32.4	D	0.486	53.8	59.7	56.6
M-18	SR-99 SB California Ave On	965	1,900	No	29.9	D	0.436	55.0	59.7	57.4
M-19	SR-99 SB SR-58 On	1,268	1,900	No	27.3	C	0.403	55.7	61.2	58.2
M-20	SR-99 SB Real Rd On	321	2,100	No	24.6	C	0.344	57.1	59.8	58.6
M-21	SR-99 SB Ming Ave On	523	2,100	No	29.3	D	0.405	55.7	59.4	57.0
M-22	SR-99 SB White Ln WB On	161	1,900	No	20.1	C	0.336	57.3	61.7	58.9
M-23	SR-99 SB White Ln EB On	162	2,100	No	20.0	C	0.313	57.8	61.5	59.2

HCM 2000
Diverge Ramp Junctions
Capacity Analysis

Jurisdiction Bakersfield, CA Agency or Company TRIP
 Analysis Year Existing (2008) Date 3.3.10
 Analyst BP Project Description Centennial Corridor Study

General Information

Freeway Data

Freeway Volume Adjustment

Freeway/ Direction			Analysis	Freeway Volume Adjustment												Flow Rate
Off-ramp			Time Period	Lanes	S _{FF} (mph)	V (vph)	PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	V _P (pcph)	
D-2	SR-58 EB	Union Ave Off	PM	2	65.0	3,562	0.92	Level	11%	0.0%	1.5	1.2	0.948	1.00	4,085	
D-3	SR-58 WB	Brundage Ln Off	PM	2	65.0	3,053	0.92	Level	9%	0.0%	1.5	1.2	0.957	1.00	3,468	
D-4	SR-58 WB	Chester Ave Off	PM	2	65.0	3,296	0.92	Level	8%	0.0%	1.5	1.2	0.962	1.00	3,726	
D-5	SR-58 WB	SR-99 NB Off	PM	2	65.0	3,291	0.92	Level	8%	0.0%	1.5	1.2	0.962	1.00	3,720	
D-6	SR-58 WB	SR-99 SB Off	PM	2	65.0	2,207	0.92	Level	2%	0.0%	1.5	1.2	0.990	1.00	2,423	
D-7	SR-99 NB	White Ln Off	PM	3	65.0	2,448	0.90	Level	16%	0.0%	1.5	1.2	0.926	1.00	2,938	
D-8	SR-99 NB	Ming Ave Off	PM	4	65.0	3,722	0.94	Level	12%	0.0%	1.5	1.2	0.943	1.00	4,197	
D-9	SR-99 NB	SR-58 Off	PM	4	65.0	4,534	0.93	Level	10%	0.0%	1.5	1.2	0.952	1.00	5,119	
D-10	SR-99 NB	California Ave Off	PM	4	65.0	4,742	0.93	Level	13%	0.0%	1.5	1.2	0.939	1.00	5,430	
D-11	SR-99 NB	Rosedale Hwy Off	PM	4	65.0	4,990	0.92	Level	12%	0.0%	1.5	1.2	0.943	1.00	5,749	
D-12	SR-99 NB	Buck Owens Blvd Off	PM	4	65.0	3,230	0.92	Level	15%	0.0%	1.5	1.2	0.930	1.00	3,774	
D-13	SR-99 NB	Airport Dr Off	PM	4	65.0	3,405	0.89	Level	15%	0.0%	1.5	1.2	0.930	1.00	4,113	
D-14	SR-99 SB	Rosedale Hwy Off	PM	4	65.0	4,875	0.88	Level	12%	0.0%	1.5	1.2	0.943	1.00	5,872	
D-15	SR-99 SB	California Ave Off	PM	4	65.0	6,700	0.92	Level	10%	0.0%	1.5	1.2	0.952	1.00	7,647	
D-16	SR-99 SB	SR-58 Off	PM	4	65.0	6,518	0.92	Level	10%	0.0%	1.5	1.2	0.952	1.00	7,439	
D-17	SR-99 SB	Ming Ave Off	PM	4	65.0	6,027	0.92	Level	7%	0.0%	1.5	1.2	0.966	1.00	6,780	
D-18	SR-99 SB	White Ln Off	PM	3	65.0	4,928	0.89	Level	8%	0.0%	1.5	1.2	0.962	1.00	5,759	

HCM 2000
Diverge Ramp Junctions
Capacity Analysis

General Information

Off-Ramp Data

Off-Ramp Volume Adjustment

Freeway/ Direction			Off-ramp		S _{FR}		V _R	Decel Lane (ft)			Truck/ Flow Rate									
			Type	Lanes	(mph)	(vph)	L _{D1}	L _{D2}	L _{Deff}	PHF	Terrain	Bus %	RV %	E _T	E _R	f _{HV}	f _P	v _p (pcph)		
D-2	SR-58 EB	Union Ave Off	Right	1	45.0	557	140		140	0.90	Level	12%	0.0%	1.5	1.2	0.943	1.00	656		
D-3	SR-58 WB	Brundage Ln Off	Right	1	25.0	350	150		150	0.88	Level	5%	0.0%	1.5	1.2	0.976	1.00	408		
D-4	SR-58 WB	Chester Ave Off	Right	1	45.0	464	140		140	0.90	Level	2%	0.0%	1.5	1.2	0.990	1.00	521		
D-5	SR-58 WB	SR-99 NB Off	Right	1	55.0	1,084	160		160	0.90	Level	19%	0.0%	1.5	1.2	0.913	1.00	1,319		
D-6	SR-58 WB	SR-99 SB Off	Right	1	25.0	1,124	110		110	0.88	Level	3%	0.0%	1.5	1.2	0.985	1.00	1,296		
D-7	SR-99 NB	White Ln Off	Right	1	45.0	338	140		140	0.90	Level	4%	0.0%	1.5	1.2	0.980	1.00	383		
D-8	SR-99 NB	Ming Ave Off	Right	1	25.0	403	200		200	0.90	Level	1%	0.0%	1.5	1.2	0.995	1.00	450		
D-9	SR-99 NB	SR-58 Off	Right	1	55.0	1,437	140		140	0.92	Level	5%	0.0%	1.5	1.2	0.976	1.00	1,601		
D-10	SR-99 NB	California Ave Off	Right	1	45.0	678	140		140	0.90	Level	1%	0.0%	1.5	1.2	0.995	1.00	757		
D-11	SR-99 NB	Rosedale Hwy Off	Right	1	45.0	1,760	140		140	0.90	Level	6%	0.0%	1.5	1.2	0.971	1.00	2,014		
D-12	SR-99 NB	Buck Owens Blvd Off	Right	1	25.0	304	140		140	0.88	Level	11%	0.0%	1.5	1.2	0.948	1.00	364		
D-13	SR-99 NB	Airport Dr Off	Right	1	45.0	1,211	300		300	0.88	Level	4%	0.0%	1.5	1.2	0.980	1.00	1,404		
D-14	SR-99 SB	Rosedale Hwy Off	Right	1	45.0	633	140		140	0.92	Level	9%	0.0%	1.5	1.2	0.957	1.00	719		
D-15	SR-99 SB	California Ave Off	Right	1	45.0	1,027	140		140	0.92	Level	1%	0.0%	1.5	1.2	0.995	1.00	1,122		
D-16	SR-99 SB	SR-58 Off	Right	1	55.0	1,896	160		160	0.92	Level	16%	0.0%	1.5	1.2	0.926	1.00	2,226		
D-17	SR-99 SB	Ming Ave Off	Right	1	45.0	1,557	210		210	0.90	Level	1%	0.0%	1.5	1.2	0.995	1.00	1,739		
D-18	SR-99 SB	White Ln Off	Right	2	45.0	2,029	140	1,150	1,430	0.88	Level	3%	0.0%	1.5	1.2	0.985	1.00	2,340		

**HCM 2000
Diverge Ramp Junctions
Capacity Analysis**

General Information

Adjacent Upstream Ramp Data

Freeway/ Direction			Off-ramp			Volume				Truck/ Bus %		Flow Rate			
			Exists?	Distance	(vph)	PHF	Terrain	RV %	E _T	E _R	f _{HV}	f _P	v _p (pcph)		
D-2	SR-58 EB	Union Ave Off	No												
D-3	SR-58 WB	Brundage Ln Off	No												
D-4	SR-58 WB	Chester Ave Off	No												
D-5	SR-58 WB	SR-99 NB Off	No												
D-6	SR-58 WB	SR-99 SB Off	No												
D-7	SR-99 NB	White Ln Off	No												
D-8	SR-99 NB	Ming Ave Off	No												
D-9	SR-99 NB	SR-58 Off	No												
D-10	SR-99 NB	California Ave Off	No												
D-11	SR-99 NB	Rosedale Hwy Off	No												
D-12	SR-99 NB	Buck Owens Blvd Off	No												
D-13	SR-99 NB	Airport Dr Off	No												
D-14	SR-99 SB	Rosedale Hwy Off	No												
D-15	SR-99 SB	California Ave Off	No												
D-16	SR-99 SB	SR-58 Off	No												
D-17	SR-99 SB	Ming Ave Off	No												
D-18	SR-99 SB	White Ln Off	On	5,270	458	0.95	Level	1%	0.0%	1.5	1.2	0.995	1.00	485	

HCM 2000
Diverge Ramp Junctions
Capacity Analysis

General Information

Adjacent Downstream Ramp Data

v₁₂ Estimation

Freeway/ Direction			Off-ramp	Exists?	Distance	Volume (vph)	PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	Flow Rate v _p (pcph)	v ₁₂ Estimation				
																L _{EQ}		v ₁₂		
																25-13	25-14	P _{FD}	(pcph)	
D-2	SR-58 EB	Union Ave Off		No														1.000	4,085	
D-3	SR-58 WB	Brundage Ln Off		No														1.000	3,468	
D-4	SR-58 WB	Chester Ave Off		No														1.000	3,726	
D-5	SR-58 WB	SR-99 NB Off		No														1.000	3,720	
D-6	SR-58 WB	SR-99 SB Off		No														1.000	2,423	
D-7	SR-99 NB	White Ln Off		On	1,250	1,155	0.86	Level	4.0%	0.0%	1.5	1.2	0.980	1.00	1,370		1,498	0.669	2,092	
D-8	SR-99 NB	Ming Ave Off		No														0.436	2,084	
D-9	SR-99 NB	SR-58 Off		No														0.436	3,135	
D-10	SR-99 NB	California Ave Off		No														0.436	2,795	
D-11	SR-99 NB	Rosedale Hwy Off		No														0.436	3,643	
D-12	SR-99 NB	Buck Owens Blvd Off		No														0.436	1,851	
D-13	SR-99 NB	Airport Dr Off		No														0.436	2,585	
D-14	SR-99 SB	Rosedale Hwy Off		No														0.436	2,966	
D-15	SR-99 SB	California Ave Off		No														0.436	3,967	
D-16	SR-99 SB	SR-58 Off		No														0.436	4,499	
D-17	SR-99 SB	Ming Ave Off		No														0.436	3,937	
D-18	SR-99 SB	White Ln Off		On	1,520	139	0.87	Level	1.0%	0.0%	1.5	1.2	0.995	1.00	161		18,936	1,572	0.450	3,878

HCM 2000
Diverge Ramp Junctions
Capacity Analysis

General Information

Capacity Checks

Freeway/ Direction	Off-ramp	V _{FI} (pcph)	Max V _{FI} (pcph)	LOS F?	V ₃ , V _{av34} (pcphpl)	V ₃ , V _{av34} > 2,700?	V ₃ , V _{av34} > 1.5*V ₁₂ /2?	V _{12a} (pcph)	Max V ₁₂ (pcph)	LOS F?	V _{FO} (pcph)	Max V _{FO} (pcph)	LOS F?
D-2	SR-58 EB Union Ave Off	4,085	4,700	No	0	No	No	4,085	4,400	No	3,429	4,700	No
D-3	SR-58 WB Brundage Ln Off	3,468	4,700	No	0	No	No	3,468	4,400	No	3,060	4,700	No
D-4	SR-58 WB Chester Ave Off	3,726	4,700	No	0	No	No	3,726	4,400	No	3,205	4,700	No
D-5	SR-58 WB SR-99 NB Off	3,720	4,700	No	0	No	No	3,720	4,400	No	2,401	4,700	No
D-6	SR-58 WB SR-99 SB Off	2,423	4,700	No	0	No	No	2,423	4,400	No	1,126	4,700	No
D-7	SR-99 NB White Ln Off	2,938	7,050	No	846	No	No	2,092	4,400	No	2,555	7,050	No
D-8	SR-99 NB Ming Ave Off	4,197	9,400	No	1,057	No	No	2,084	4,400	No	3,747	9,400	No
D-9	SR-99 NB SR-58 Off	5,119	9,400	No	992	No	No	3,135	4,400	No	3,518	9,400	No
D-10	SR-99 NB California Ave Off	5,430	9,400	No	1,318	No	No	2,795	4,400	No	4,673	9,400	No
D-11	SR-99 NB Rosedale Hwy Off	5,749	9,400	No	1,053	No	No	3,643	4,400	No	3,735	9,400	No
D-12	SR-99 NB Buck Owens Blvd Off	3,774	9,400	No	962	No	No	1,851	4,400	No	3,410	9,400	No
D-13	SR-99 NB Airport Dr Off	4,113	9,400	No	764	No	No	2,585	4,400	No	2,709	9,400	No
D-14	SR-99 SB Rosedale Hwy Off	5,872	9,400	No	1,453	No	No	2,966	4,400	No	5,153	9,400	No
D-15	SR-99 SB California Ave Off	7,647	9,400	No	1,840	No	No	3,967	4,400	No	6,525	9,400	No
D-16	SR-99 SB SR-58 Off	7,439	9,400	No	1,470	No	No	4,499	4,400	Yes	5,213	9,400	No
D-17	SR-99 SB Ming Ave Off	6,780	9,400	No	1,422	No	No	3,937	4,400	No	5,042	9,400	No
D-18	SR-99 SB White Ln Off	5,759	7,050	No	1,880	No	No	3,878	4,400	No	3,418	7,050	No

**HCM 2000
Diverge Ramp Junctions
Capacity Analysis**

General Information

Results

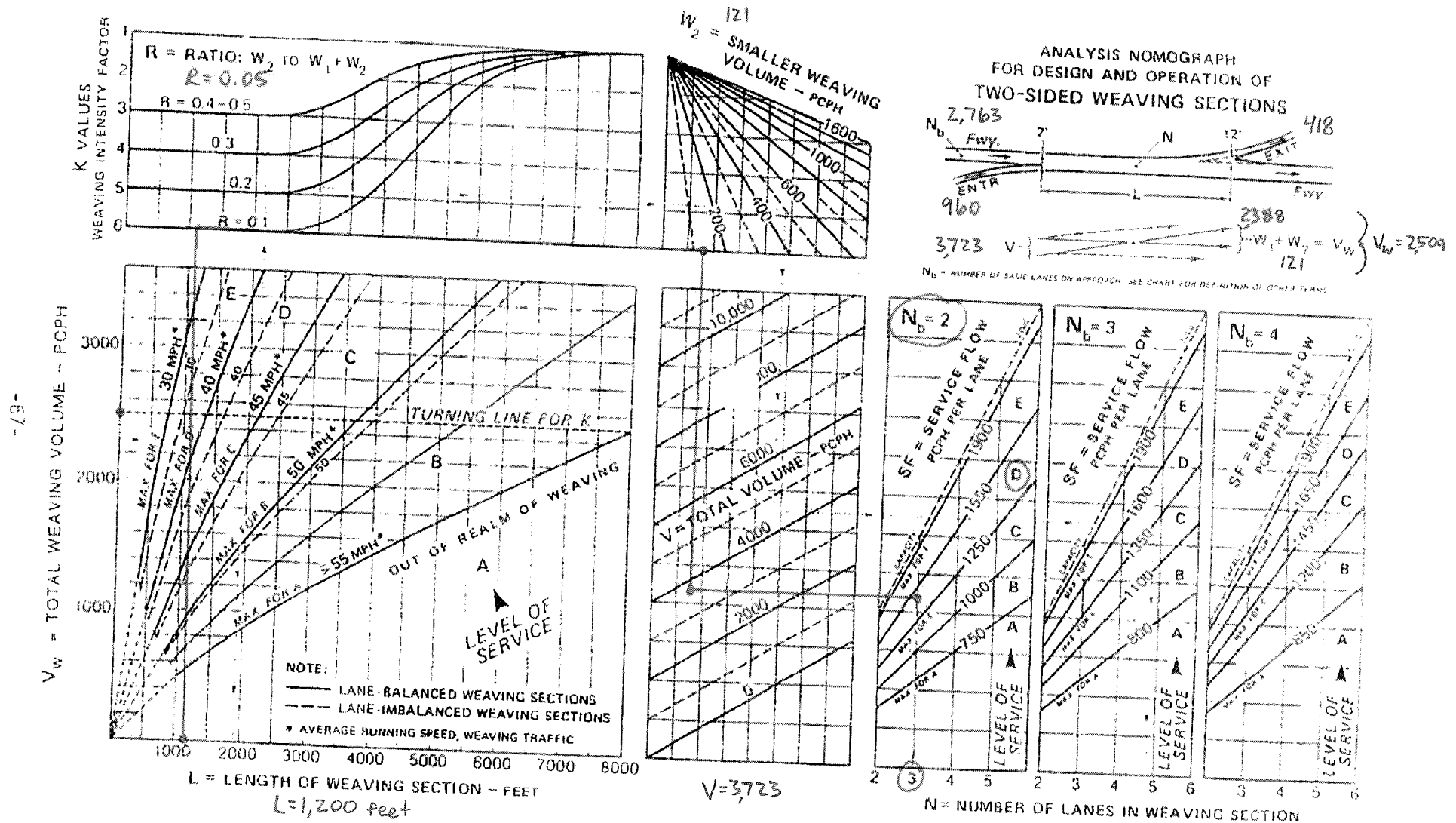
Speed Estimation

Freeway/ Direction		Off-ramp		V _R (pcph)	Max V _R (pcph)	LOS F?	Density, D (pcplpm)	Level of Service	Int. Var. D _s	Inf. Area S _R (mph)	Out Lns. S _O (mph)	All vehs. S (mph)
D-2	SR-58 EB	Union Ave Off		656	2,100	No	38.1	E	0.357	56.8	0.0	56.8
D-3	SR-58 WB	Brundage Ln Off		408	1,900	No	32.7	D	0.595	51.3	0.0	51.3
D-4	SR-58 WB	Chester Ave Off		521	2,100	No	35.0	E	0.345	57.1	0.0	57.1
D-5	SR-58 WB	SR-99 NB Off		1,319	2,200	No	34.8	D	0.287	58.4	0.0	58.4
D-6	SR-58 WB	SR-99 SB Off		1,296	1,900	No	24.1	C	0.675	49.5	0.0	49.5
D-7	SR-99 NB	White Ln Off		383	2,100	No	21.0	C	0.332	57.4	71.3	60.8
D-8	SR-99 NB	Ming Ave Off		450	1,900	No	20.4	C	0.599	51.2	71.1	59.6
D-9	SR-99 NB	SR-58 Off		1,601	2,200	No	30.0	D	0.312	57.8	71.3	62.4
D-10	SR-99 NB	California Ave Off		757	2,100	No	27.0	C	0.366	56.6	70.1	62.4
D-11	SR-99 NB	Rosedale Hwy Off		2,014	2,100	No	34.3	D	0.479	54.0	71.1	59.2
D-12	SR-99 NB	Buck Owens Blvd Off		364	1,900	No	18.9	B	0.591	51.4	71.3	59.9
D-13	SR-99 NB	Airport Dr Off		1,404	2,100	No	23.8	C	0.424	55.2	71.3	60.3
D-14	SR-99 SB	Rosedale Hwy Off		719	2,100	No	28.5	D	0.363	56.7	69.5	62.4
D-15	SR-99 SB	California Ave Off		1,122	2,100	No	37.1	E	0.399	55.8	68.0	61.1
D-16	SR-99 SB	SR-58 Off		2,226	2,200	Yes	-	F	0.368	56.5	69.5	61.0
D-17	SR-99 SB	Ming Ave Off		1,739	2,100	No	36.2	E	0.454	54.5	69.7	60.0
D-18	SR-99 SB	White Ln Off		2,340	4,100	No	24.7	C	0.509	53.3	67.9	57.3

ATTACHMENT 3 – LEISCH METHOD CALCULATIONS

CENTENNIAL CORRIDOR
EXISTING AM PEAK HOUR

EASTBOUND SR 58
SR 99 TO H STREET

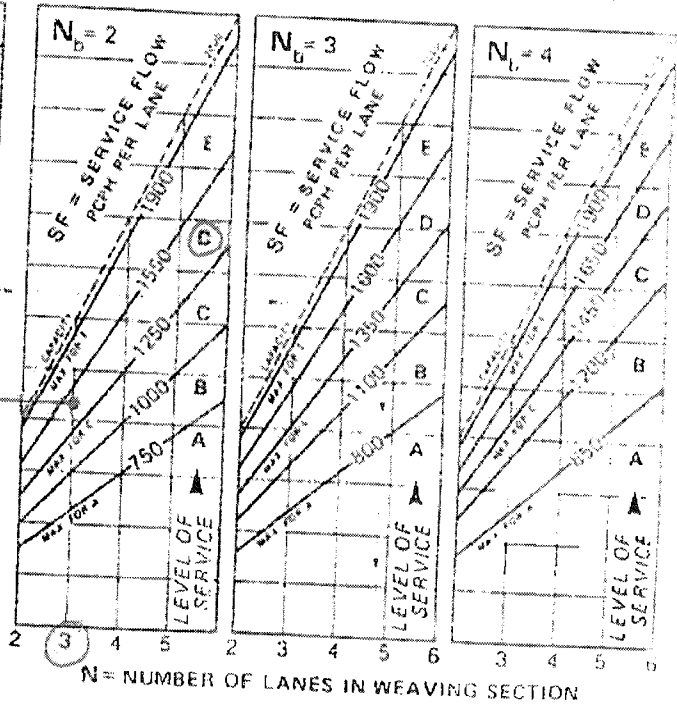
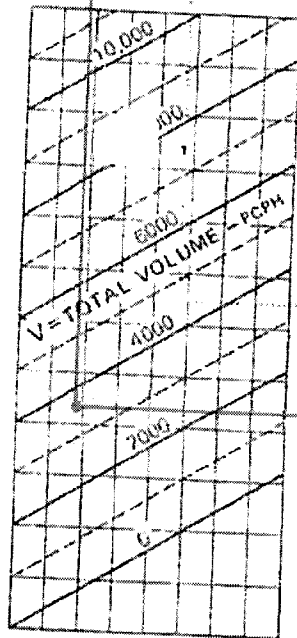
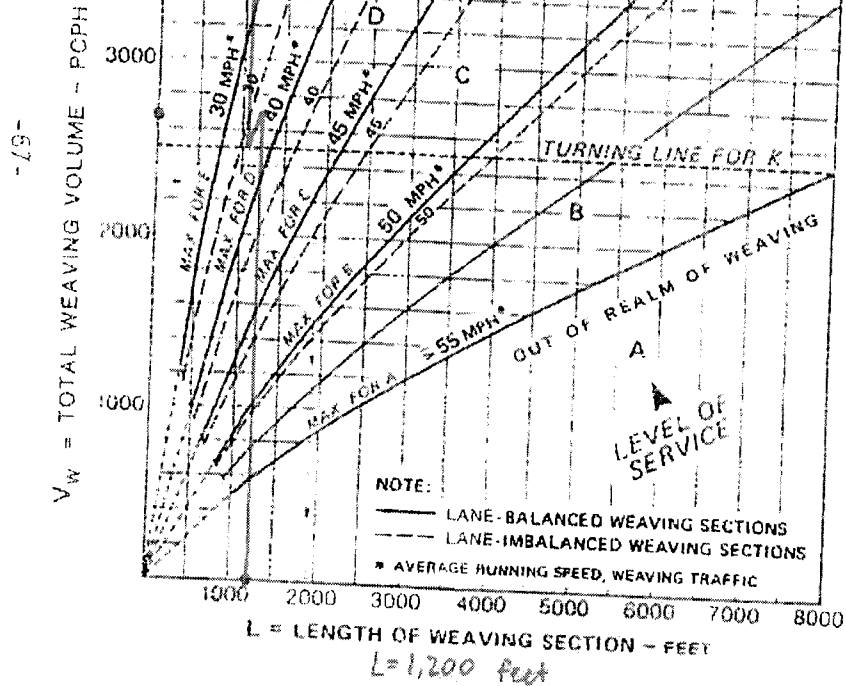
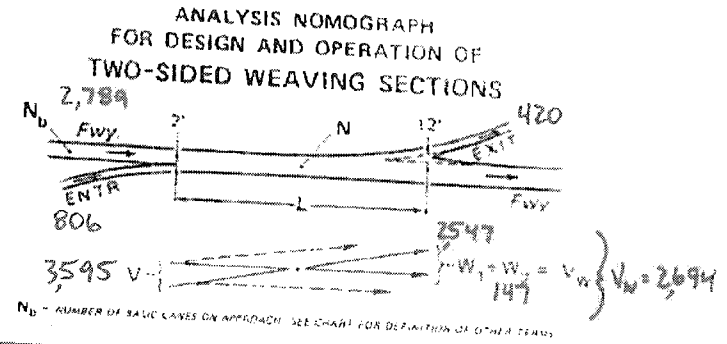
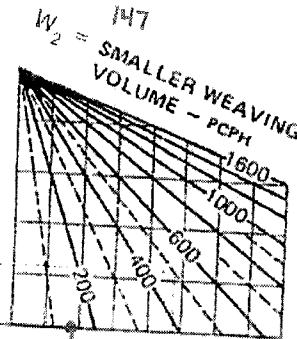
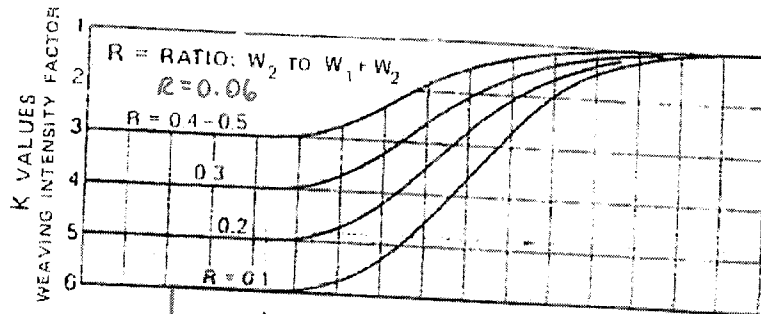


NOMOGRAPH FOR DESIGN AND ANALYSIS OF WEAVING SECTIONS—TWO-SIDED CONFIGURATIONS

NOMOGRAPH 2

CENTENNIAL CORRIDOR
EXISTING PM PEAK HOUR

EASTBOUND SR 58
SR 99 TO H STREET



NOMOGRAPH FOR DESIGN AND ANALYSIS OF WEAVING SECTIONS - TWO-SIDED CONFIGURATIONS

NOMOGRAPH 2

ATTACHMENT 4 – HCS+ SAMPLE RESULTS

Phone:
E-mail:

Fax:

Operational Analysis

Analyst: BP
 Agency or Company: Fehr & Peers
 Date Performed: 4/21/2010
 Analysis Time Period: AM Peak Hour
 Freeway/Direction: SR-58 Eastbound
 From/To: Chester Avenue to Union Avenue
 Jurisdiction: Bakersfield
 Analysis Year: Existing
 Description: Centennial Corridor Study

Flow Inputs and Adjustments

Volume, V	3618	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	983	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2065	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2065	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	60.3	mi/h
Number of lanes, N	2	
Density, D	34.3	pc/mi/ln

Level of service, LOS

D

Overall results are not computed when free-flow speed is less than 55 mph.

Phone:
E-mail:

Fax:

Merge Analysis

Analyst: BP
Agency/Co.: Fehr & Peers
Date performed: 4/21/2010
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR-58 Westbound
Junction: H Street
Jurisdiction: Bakersfield
Analysis Year: Existing
Description: Centennial Corridor Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2622	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	333	vph
Length of first accel/decel lane	540	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2622	333		vph
Peak-hour factor, PHF	0.88	0.90		
Peak 15-min volume, v15	745	93		v
Trucks and buses	15	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade		%	%	%
Length		mi	mi	mi
Trucks and buses PCE, ET	1.5*	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.930	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3203	377	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F(P_{FM}) = 3203 \text{ pc/h}$

Capacity Checks

		Actual	Maximum	LOS F?
v		3580	4700	No
FO				
v	v	0 pc/h	(Equation 25-4 or 25-5)	
3 or av34				
Is v	v	> 2700 pc/h?	No	
3 or av34				
Is v	v	> 1.5 v /2	No	
3 or av34		12		
If yes, v	= 3203		(Equation 25-8)	
12A				

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v	3203	4600	No
R12			

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 29.8 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	M = 0.412	
	S	
Space mean speed in ramp influence area,	S = 55.5	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 55.5	mph

Phone:
E-mail:

Fax:

Diverge Analysis

Analyst: BP
Agency/Co.: Fehr & Peers
Date performed: 4/21/2010
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR-58 Eastbound
Junction: Union Avenue
Jurisdiction: Bakersfield
Analysis Year: Existing
Description: Centennial Corridor Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3618	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	821	vph
Length of first accel/decel lane	140	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3618	821		vph
Peak-hour factor, PHF	0.92	0.90		
Peak 15-min volume, v15	983	228		v
Trucks and buses	10	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.952	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4129	930	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P = 4129$ pc/h
 FD

Capacity Checks

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	4129	4700	No
$v_{FO} = v_F - v_R$	3199	4700	No
v_R	930	2100	No
$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } av34} > 2700$ pc/h?		No	
Is $v_{3 \text{ or } av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 4129$		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4129	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 38.5$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	$D_S = 0.382$	
Space mean speed in ramp influence area,	$S_R = 56.2$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 56.2$	mph



TECHNICAL MEMORANDUM

Date: April 22, 2010

To: Steve McDonald and Koko Widyatmoko, Caltrans
Curt Hatton, Caltrans Project Manager
Ravi Puttagunta, TRIP PMC (Parsons)
Doug Slakey / Bruce Tafoya, TRIP Corridor Manager
Mike Kraman, Jim Billings, Luis Porrello, and Traci Gleason, HNTB

From: Mike Beattie, Bill Penney, and Fred Choa, Fehr & Peers

Subject: ***Centennial Corridor – Existing Conditions Analysis Results
Updated Based on TRIP/Caltrans Comments***

RS08-2569

The purpose of this technical memorandum is to present the existing conditions freeway analysis results for the Centennial Corridor Project. Based on comments received on the December 4, 2009, technical memorandum, we have updated the peak hour factors and volumes. It should be noted that the truck percentages and lanes are consistent with the previous submittal.

ANALYSIS METHODOLOGY

The freeway study area includes State Route (SR) 99 from south of White Lane to north of Airport Road and SR 58 from SR 99 to east of Union Avenue (SR 204). Using the method described in the *Highway Capacity Manual* (pages 22-4 and 22-5), the freeway segments were divided into basic, merge, diverge, and weave analysis locations. We have analyzed the freeway basic, merge, and diverge sections according to the procedures in the *Highway Capacity Manual*. For weave sections, we used the Leisch Method as specified in Section 504.7 of the *Highway Design Manual*.

Under existing conditions, the traffic volumes, peak hour factors, and truck percentages are based on field collected data. Distances for acceleration lanes (merge), deceleration lanes (diverge), and weaving lengths (weave) were determined from aerial photographs. For weave sections, the weaving volumes were developed using select link volumes from the KernCOG regional Travel Demand Forecasting (TDF) model. Figure 1 shows the freeway lane configurations under existing conditions, and Figure 2 shows the existing conditions traffic volumes.

The *Highway Capacity Manual* equations for freeway basic, merge, and diverge section analysis were incorporated in an Excel spreadsheet for ease of data entry and comparison among multiple locations. For comparison, we have provided HCS+ software results for three study locations in Attachment 3 (i.e. one basic, one merge, and one diverge section).

The only weave section under existing conditions is eastbound SR 58 between SR 99 and H Street. This segment is a "two-sided" weave. That is, the ramp from Real Road functions as a left-side on-ramp, and the H Street off-ramp is on the right side. So, traffic from Real Road exiting to H Street must weave across the mainline. The Leisch Method for a two-sided weave section is described in *Procedure for Analysis and Design of Weaving Sections* (Jack E. Leisch,

October 1985), which also describes the one-sided weave analysis method presented in the *Highway Design Manual*.

EXISTING TRAFFIC VOLUMES

The traffic counts for the majority of the freeway analysis locations were collected on October 28, 2008. The exceptions are the southbound SR 99 ramps at Ming Avenue (PM only), southbound SR 99 on-ramp at Airport Drive, and the Rosedale Highway/Buck Owens Boulevard interchange ramps. The first two locations were counted after October 28, 2008 due to problems with the counting equipment. The last location uses data collected for the Rosedale Widening project on November 6 and 8, 2007.

The peak hour volumes used in the analysis of each ramp were determined by the peak hour at each individual ramp. The peak hour ramp volumes were used to balance the mainline volumes between interchanges.

The SR 58 mainline was counted between Real Road and SR 99. The SR 99 mainline was counted between Ming Avenue and SR 58. For both of these mainline segments, the morning peak hour started at 7:15 AM and the afternoon peak hour started at 4:45 PM. The freeway mainline volumes between other interchanges were calculated by adding and/or subtracting the peak hour volumes at the on-ramps and off-ramps as described in the previous paragraph.

Peak hour factors (PHF) were calculated for each ramp and the mainline segment between interchanges. The PHF calculation was based on the following volume thresholds documented on page 5-4 of the Synchro 6 User Guide:

- Volume approach is greater than 2,000 vehicles per hour, PHF = 0.95
- Volume approach is between 1,000 to 2,000 vehicles per hour, PHF = 0.93
- Volume approach is between 500 to 1,000 vehicles per hour, PHF = 0.92
- Volume approach is between 200 to 500 vehicles per hour, PHF = 0.87
- Volume approach is between 100 to 200 vehicles per hour, PHF = 0.83
- Volume approach is between 1 to 100 vehicles per hour, PHF = 0.78

Truck volumes were collected at all locations counted in 2008. For the purposes of the counts, trucks were considered to be all heavy vehicles with two or more axles including delivery vans, buses, and recreational vehicles. For the Rosedale Highway intersections, the truck volumes assumed for the Rosedale Widening intersection analysis were used. Truck percentages were calculated as the truck volume divided by total volume.

EXISTING CONDITIONS ANALYSIS RESULTS

Tables 1 through 4 below present the freeway analysis results for the study area under existing conditions. Attachment 1 lists the HCM basic, merge, and diverge calculations, and Attachment 2 provides the Leisch weave calculations.

For eastbound SR 58 (see Table 1), the section between Chester Avenue and Union Avenue generally has the highest peak hour volumes in the study area. As a result, the density is the highest in this section. During both the AM and PM peak hours, the Union Avenue off-ramp in this section operates at LOS E. All other analysis locations operate at LOS D during both the AM and PM peak hours, except for the basic mainline section between the Union Avenue off- and on-ramps which operates at LOS C during the AM peak hour.

**Table 1 – Freeway Mainline and Ramp Junction Level of Service
Existing Conditions: SR 58 Eastbound**

Location	Lanes	Type	AM Peak Hour			PM Peak Hour		
			LOS	Density ¹	Speed ¹	LOS	Density ¹	Speed ¹
SR-99 to H St	3	Weave ²	D	-	-	D	-	-
H St Off-ramp to Chester Ave On-ramp	2	Basic	D	29.0	63.5	D	27.0	64.3
Chester Ave On-ramp	2	Merge	D	34.9	52.5	D	33.8	53.3
Chester Ave to Union Ave	2	Basic	D	34.3	60.3	D	33.7	60.7
Union Ave Off-ramp	2	Diverge	E	38.5	56.2	E	38.1	56.8
Union Ave Off-ramp to On-ramp	2	Basic	C	24.7	64.9	D	27.4	64.2
Union Ave SB On-ramp	2	Merge	D	29.1	55.4	D	31.8	54.3
Union Ave NB On-ramp	2	Merge	D	30.5	55.3	D	33.5	53.6
Union Ave to Cottonwood Rd	2	Basic	D	28.1	63.9	D	33.2	61.0

Notes:

1. Density is reported in vehicles per lane per mile, and speed is reported in miles per hour. Both were calculated per Highway Capacity Manual 2000.
2. Weave section analysis was performed using the Leisch Method, which does not provide density or speed estimates.

Source: Fehr & Peers, 2010.

For westbound SR 58 (see Table 2), all locations operate at LOS D or better except at the Brundage Lane off-ramp (AM peak hour) and Chester Avenue off-ramp (AM and PM peak hour) which operate at LOS E.

**Table 2 – Freeway Mainline and Ramp Junction Level of Service
Existing Conditions: SR 58 Westbound**

Location	Lanes	Type	AM Peak Hour			PM Peak Hour		
			LOS	Density ¹	Speed ¹	LOS	Density ¹	Speed ¹
Cottonwood Rd to Union Ave	2	Basic	D	30.4	62.8	D	26.9	64.4
Brundage Ln Off-ramp	2	Diverge	E	35.7	50.9	D	32.7	51.3
Brundage Ln Off-ramp to On-ramp	2	Basic	C	24.8	64.9	C	23.6	65.0
Brundage Ln On-ramp	2	Merge	D	29.4	55.3	D	28.5	55.6
Union Ave SB On-ramp	2	Merge	D	31.3	54.4	D	31.0	54.5
Chester Ave Off-ramp	2	Diverge	E	35.2	57.0	E	35.0	57.1
Chester Ave Off-ramp to H St On-ramp	2	Basic	C	24.7	64.9	C	24.8	64.9
H St On-ramp	2	Merge	D	29.8	55.5	D	31.0	55.0
H St to SR-99	2	Basic	D	27.9	64.0	D	29.4	63.3
SR-99 NB Off-ramp	2	Diverge	D	33.6	58.2	D	34.8	58.4
SR-99 NB Off-ramp to SB Off-ramp	2	Basic	B	17.0	65.0	C	18.6	65.0
SR-99 SB Off-ramp	2	Diverge	C	22.2	49.9	C	24.1	49.5
Notes: 1. Density is reported in vehicles per lane per mile, and speed is reported in miles per hour. Both were calculated per Highway Capacity Manual 2000. Source: Fehr & Peers, 2010.								

The majority of analysis locations on northbound SR 99 operate at LOS C or better (see Table 3). The following seven locations operate at LOS D.

- White Lane to Ming Avenue (AM peak hour)
- Ming Avenue on-ramp (AM peak hour)
- SR 58 off-ramp (PM peak hour)
- SR 58 on-ramp (AM peak hour)
- SR 58 to California Avenue (AM Peak Hour)
- California Avenue to Rosedale Highway (AM peak hour)
- Rosedale Highway off-ramp (PM peak hour)

In addition, five locations operate at LOS E or F during the AM and PM peak hour:

- White Lane eastbound on-ramp (AM peak hour)
- White Lane westbound on-ramp (AM peak hour)
- SR 58 off-ramp (AM peak hour)
- California Avenue off-ramp (AM peak hour)
- Rosedale Highway off-ramp (AM peak hour)

Table 3 – Freeway Mainline and Ramp Junction Level of Service
Existing Conditions: SR 99 Northbound

Location	Lanes	Type	AM Peak Hour			PM Peak Hour		
			LOS	Density ¹	Speed ¹	LOS	Density ¹	Speed ¹
Panama Ln to White Ln	3	Basic	C	21.9	65.0	B	15.1	65.0
White Ln Off-ramp	3	Diverge	C	27.3	61.2	C	21.0	60.8
White Ln Off-ramp to On-ramp	3	Basic	C	20.6	65.0	B	13.1	65.0
White Ln EB On-ramp	3	Merge	E	35.6	53.9	C	25.0	58.1
White Ln WB On-ramp	3	Merge	E	35.3	54.0	C	23.9	58.6
White Ln to Ming Ave	3	Basic	D	34.9	59.8	C	21.5	65.0
Ming Ave Off-ramp	4	Diverge	C	27.6	59.4	C	20.4	59.6
Ming Ave Off-ramp to On-ramp	4	Basic	C	22.8	65.0	B	14.6	65.0
Ming Ave On-ramp	4	Merge	D	31.2	57.3	C	24.0	59.5
SR-58 Off-ramp	4	Diverge	E	40.6	61.4	D	30.0	62.4
SR-58 Off-ramp to Wible Rd On-ramp	4	Basic	C	21.0	65.0	B	13.6	65.0
Wible Rd On-ramp	4	Merge	C	23.3	59.0	B	17.7	60.2
SR-58 On-ramp	4	Merge	D	31.1	57.4	C	24.8	59.4
SR-58 to California Ave	4	Basic	D	28.8	63.6	C	20.9	65.0
California Ave Off-ramp	4	Diverge	E	36.7	60.9	C	27.0	62.4
California Ave Off-ramp to On-ramp	4	Basic	C	23.4	65.0	B	18.0	65.0
California Ave EB On-ramp	4	Merge	C	25.3	58.5	C	22.2	59.4
California Ave WB On-ramp	4	Merge	C	24.8	58.5	C	21.4	59.5
California Ave to Rosedale Hwy	4	Basic	D	26.5	64.5	C	22.1	65.0
Rosedale Hwy Off-ramp	4	Diverge	E	38.2	59.5	D	34.3	59.2
Buck Owens Blvd Off-ramp	4	Diverge	C	26.3	57.7	B	18.9	59.9
Buck Owens Blvd Off-ramp to On-ramp	4	Basic	B	16.5	65.0	B	13.6	65.0
Buck Owens Blvd On-ramp	4	Merge	B	18.6	60.0	B	17.8	60.2
Airport Dr Off-ramp	4	Diverge	C	27.9	59.2	C	23.8	60.3
Airport Dr to Golden State Ave	3	Basic	B	14.4	65.0	B	14.2	65.0

Notes:

1. Density is reported in vehicles per lane per mile, and speed is reported in miles per hour. Both were calculated per Highway Capacity Manual 2000.

Source: Fehr & Peers, 2010.

The majority of analysis locations on southbound SR 99 operate at LOS C or better (see Table 4). The following locations operate at LOS D.

- Airport Drive on-ramp (PM peak hour)
- Rosedale Highway off-ramp (PM peak hour)
- Rosedale Highway westbound on-ramp (PM peak hour)
- Rosedale Highway eastbound on-ramp (PM peak hour)
- Rosedale Highway to California Avenue (PM peak hour)
- California Avenue off-ramp (AM peak hour)
- California Avenue on-ramp (PM peak hour)
- California Avenue to SR 58 (PM peak hour)
- SR 58 off-ramp (AM peak hour)
- Ming Avenue to White Lane (PM peak hour)

In addition, the PM peak hour has three locations with LOS E or F conditions. The California Avenue off-ramp and the Ming Avenue off-ramp operate at LOS E due to high mainline and ramp volumes. The SR 58 off-ramp operates at LOS F because both the off-ramp volume and the mainline volume in the right two lanes exceed their capacity. The PM peak hour field observations found slower free-flow speeds at the California Avenue off-ramp and SR 58 off-ramp. Additionally, traffic was observed to be queued onto the auxiliary lane at the White Lane off-ramp. This latter observation is not reflected in the analysis results since arterial operations on White Lane cause the queues.

Table 4 – Freeway Mainline and Ramp Junction Level of Service
Existing Conditions: SR 99 Southbound

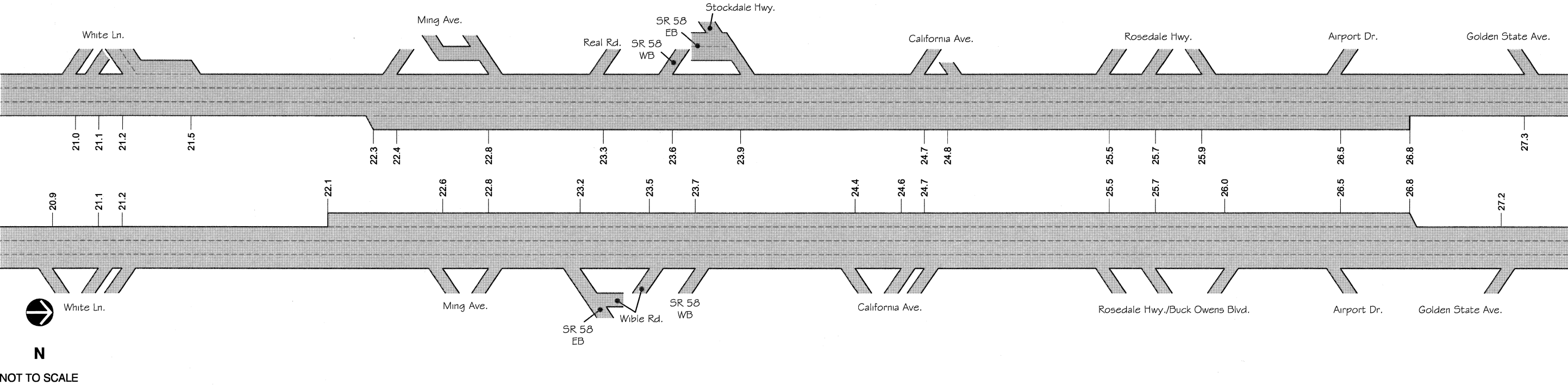
Location	Lanes	Type	AM Peak Hour			PM Peak Hour		
			LOS	Density ¹	Speed ¹	LOS	Density ¹	Speed ¹
Golden State Ave to Airport Dr	3	Basic	C	19.8	65.0	C	19.7	65.0
Airport Dr On-ramp	4	Merge	C	23.9	59.5	D	29.2	58.1
Airport Dr to Rosedale Hwy	4	Basic	C	19.4	65.0	C	22.6	65.0
Rosedale Hwy Off-ramp	4	Diverge	C	25.4	62.6	D	28.5	62.4
Rosedale Hwy Off-ramp to On-ramp	4	Basic	B	16.7	65.0	C	19.7	65.0
Rosedale Hwy WB On-ramp	4	Merge	C	21.9	59.5	D	28.9	57.9
Rosedale Hwy EB On-ramp	4	Merge	C	25.9	58.9	D	32.4	56.6
Rosedale Hwy to California Ave	4	Basic	C	23.4	65.0	D	30.5	62.7
California Ave Off-ramp	4	Diverge	D	31.8	61.2	E	37.1	61.1
California Ave Off-ramp to On-ramp	4	Basic	C	18.7	65.0	C	25.2	64.8
California Ave On-ramp	4	Merge	C	20.4	59.6	D	29.9	57.4
California Ave to SR-58	4	Basic	C	20.0	65.0	D	29.4	63.3
SR-58 Off-ramp	4	Diverge	D	31.0	61.9	F	-	-
SR-58 Off-ramp to On-ramp	4	Basic	B	13.2	65.0	C	20.1	65.0
SR-58 On-ramp	4	Merge	C	20.5	59.8	C	27.3	58.2
Real Rd On-ramp	4	Merge	B	18.3	60.1	C	24.6	58.6
Ming Ave Off-ramp	4	Diverge	C	24.7	62.1	E	36.2	60.0
Ming Ave Off-ramp to On-ramp	4	Basic	B	14.8	65.0	C	19.5	65.0
Ming Ave On-ramp	3	Merge	C	22.0	58.9	D	29.3	57.0
Ming Ave to White Ln	3	Basic	C	21.4	65.0	D	30.6	62.6
White Ln Off-ramp	3	Diverge	B	15.1	59.1	C	24.7	57.3
White Ln On-ramp to Off-ramp	3	Basic	B	13.5	65.0	B	17.7	65.0
White Ln WB On-ramp	3	Merge	B	16.1	59.6	C	20.1	58.9
White Ln EB On-ramp	3	Merge	B	16.2	59.8	C	20.0	59.2
White Ln to Panama Ln	3	Basic	B	14.7	65.0	C	19.1	65.0

Notes:

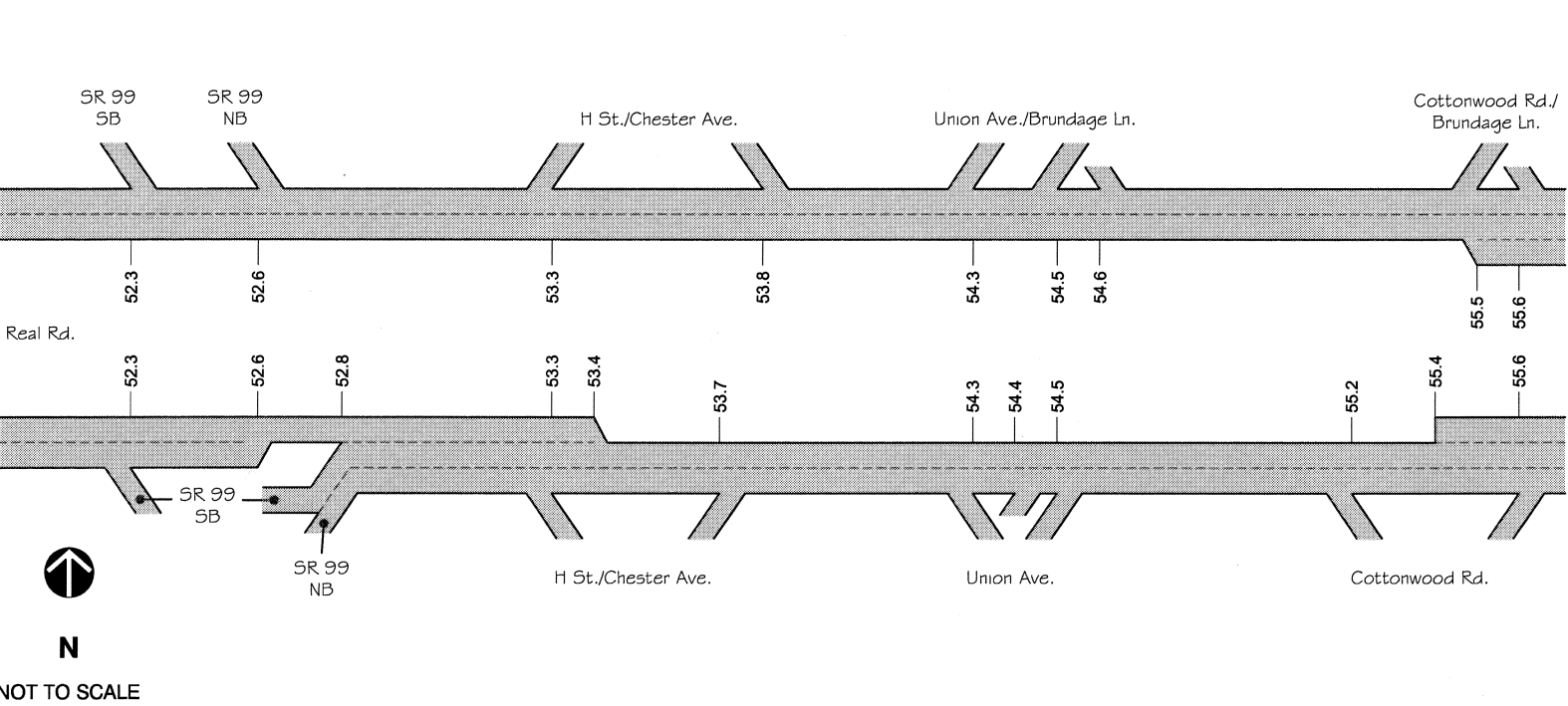
1. Density is reported in vehicles per lane per mile, and speed is reported in miles per hour. Both were calculated per Highway Capacity Manual 2000.

Source: Fehr & Peers, 2010.

State Route 99 - White Ln. to Golden State Ave.

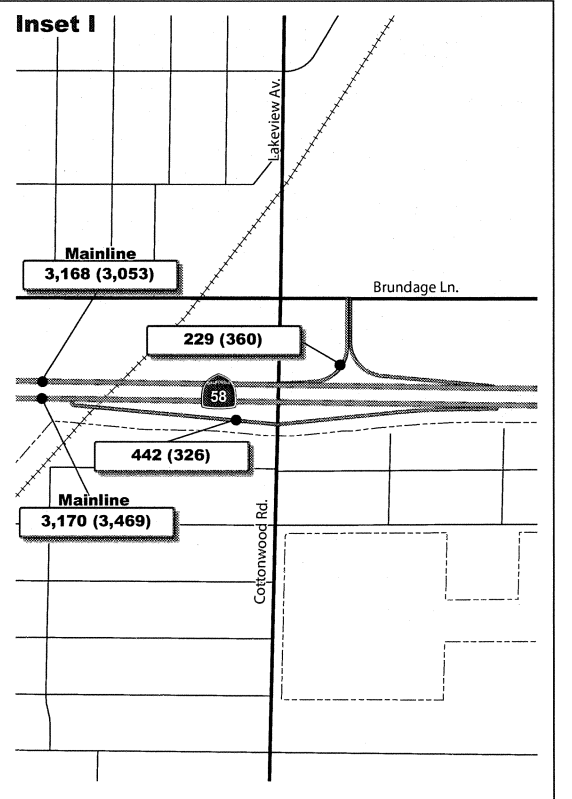
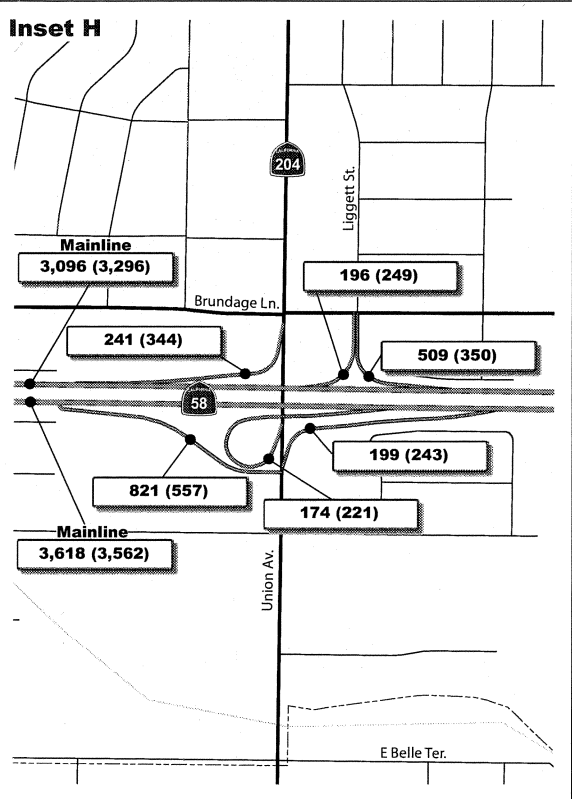
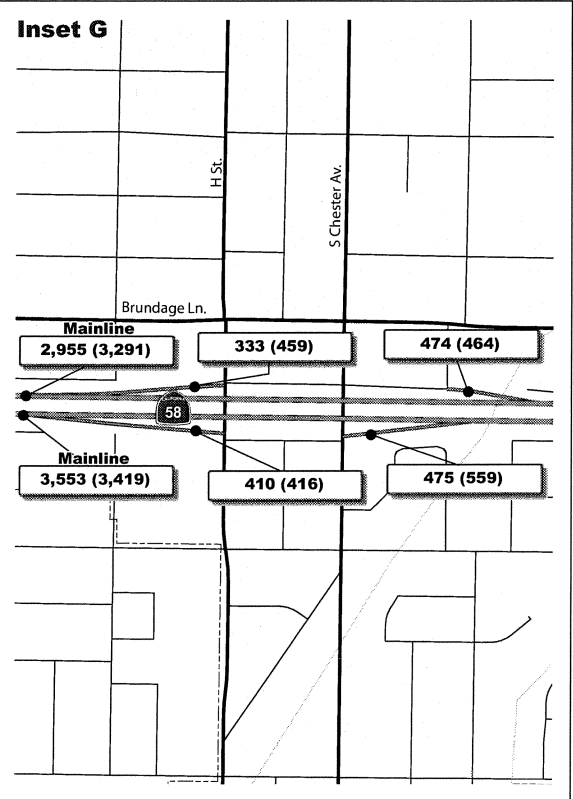
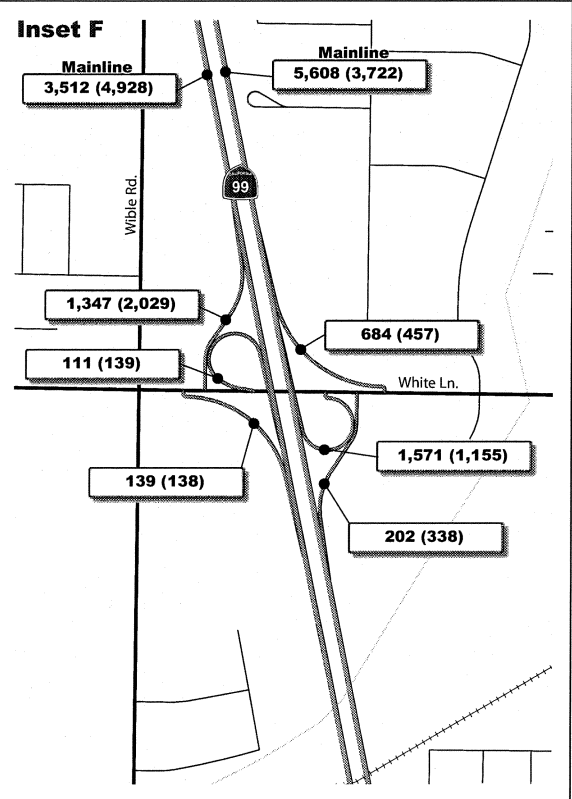
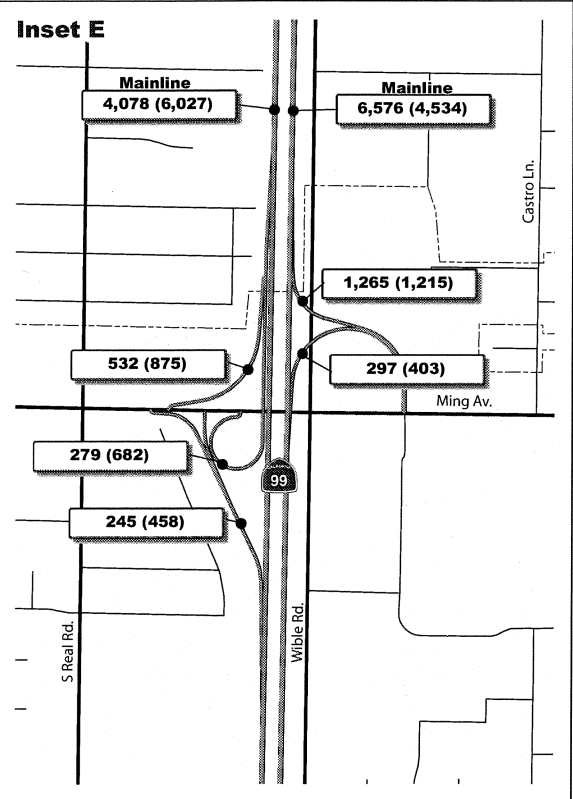
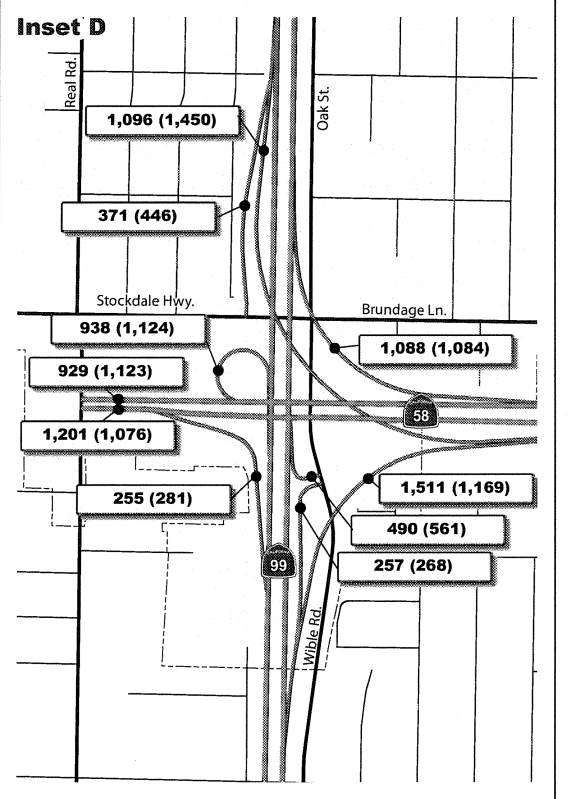
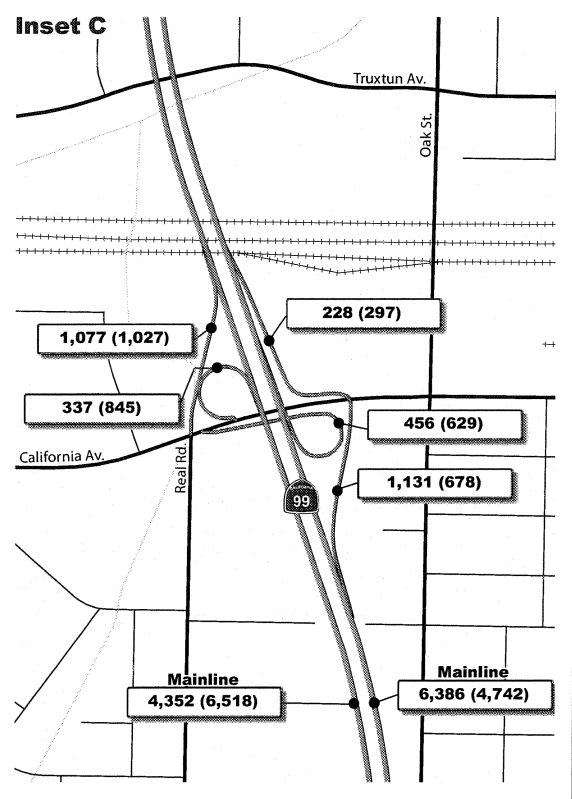
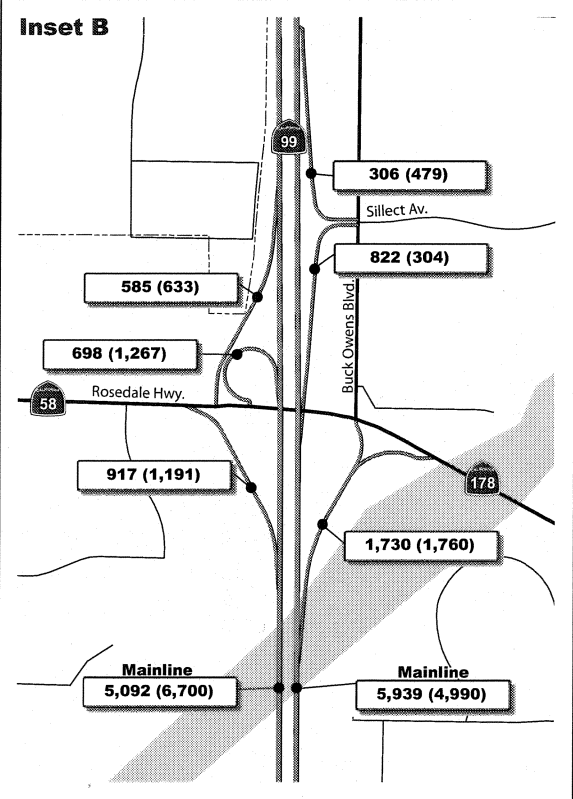
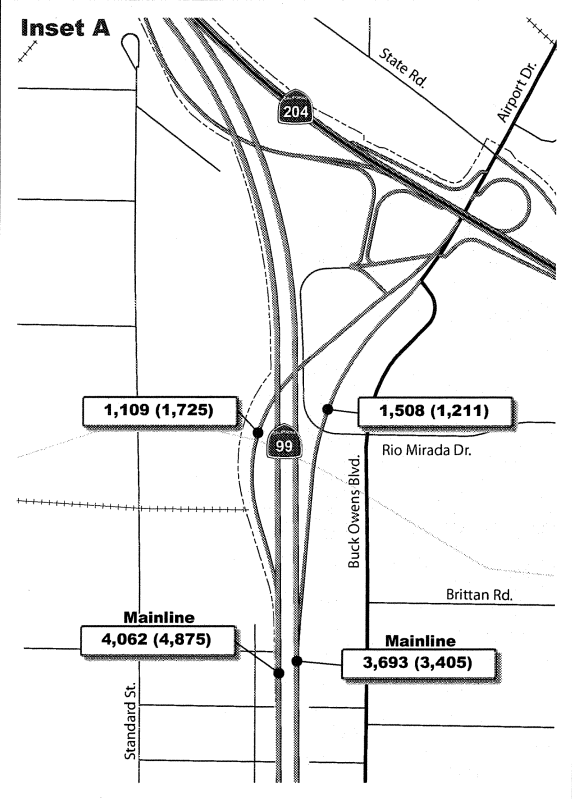
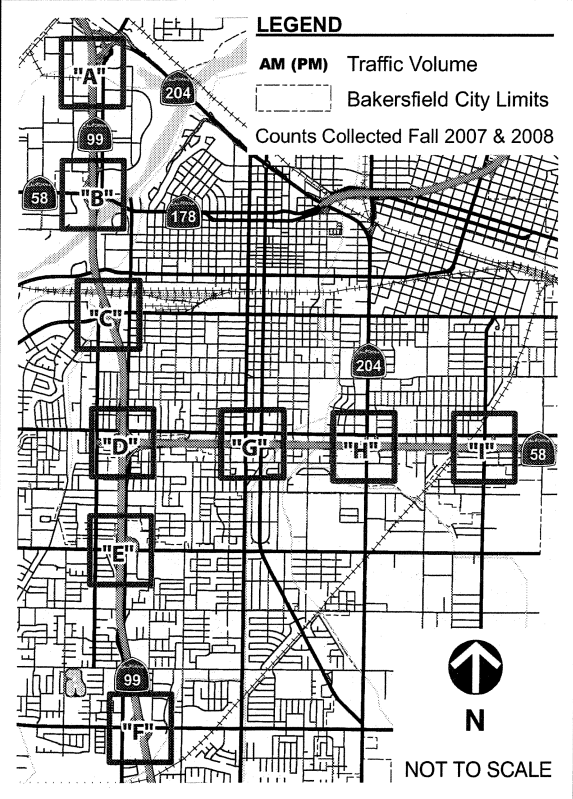


State Route 58 - Real Rd. to Cottonwood Rd.



LEGEND
6.0 Post-mile

DRAFT



**PEAK HOUR FREEWAY VOLUMES -
EXISTING CONDITIONS**

FIGURE 2

ATTACHMENT 1 – HCM CALCULATIONS

HCM 2000
Basic Freeway Segments
Capacity Analysis

Jurisdiction Bakersfield, CA Agency or Company TRIP
 Analysis Year Existing (2008) Date 3.3.10
 Analyst BP Project Description Centennial Corridor Study

General Information			Flow Rate Calculation										Speed Calculation			Results	
Freeway/ Direction	From/To	Analysis Time Period	Volume (vph)	PHF	Lanes	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	Flow Rate v _P (pcphpl)	Measured FFS (mph)	S (mph)	Density, D (pcplpm)	Level of Service
B-2	SR-58 EB H St Off to Chester Ave On	AM	3,143	0.90	2	Level	11%	0%	1.5	1.2	0.948	1.00	1,842	65.0	63.5	29.0	D
B-3	SR-58 EB Chester Ave to Union Ave	AM	3,618	0.92	2	Level	10%	0%	1.5	1.2	0.952	1.00	2,065	65.0	60.3	34.3	D
B-4	SR-58 EB Union Ave Off to On	AM	2,797	0.92	2	Level	11%	0%	1.5	1.2	0.948	1.00	1,604	65.0	64.9	24.7	C
B-5	SR-58 EB Union Ave to Cottonwood Rd	AM	3,170	0.93	2	Level	11%	0%	1.5	1.2	0.948	1.00	1,798	65.0	63.9	28.1	D
B-6	SR-58 WB Cottonwood Rd to Union Ave	AM	3,168	0.88	2	Level	12%	0%	1.5	1.2	0.943	1.00	1,908	65.0	62.8	30.4	D
B-7	SR-58 WB Brundage Ln Off to On	AM	2,659	0.88	2	Level	13%	0%	1.5	1.2	0.939	1.00	1,609	65.0	64.9	24.8	C
B-8	SR-58 WB Chester Ave Off to H St On	AM	2,622	0.88	2	Level	15%	0%	1.5	1.2	0.930	1.00	1,602	65.0	64.9	24.7	C
B-9	SR-58 WB H St to SR-99	AM	2,955	0.88	2	Level	13%	0%	1.5	1.2	0.939	1.00	1,788	65.0	64.0	27.9	D
B-10	SR-58 WB SR-99 NB Off to SB Off	AM	1,867	0.88	2	Level	8%	0%	1.5	1.2	0.962	1.00	1,103	65.0	65.0	17.0	B
B-11	SR-99 NB Panama Ln to White Ln	AM	3,555	0.88	3	Level	11%	0%	1.5	1.2	0.948	1.00	1,421	65.0	65.0	21.9	C
B-12	SR-99 NB White Ln Off to On	AM	3,353	0.88	3	Level	11%	0%	1.5	1.2	0.948	1.00	1,340	65.0	65.0	20.6	C
B-13	SR-99 NB White Ln to Ming Ave	AM	5,608	0.94	3	Level	10%	0%	1.5	1.2	0.952	1.00	2,088	65.0	59.8	34.9	D
B-14	SR-99 NB Ming Ave Off to On	AM	5,311	0.94	4	Level	10%	0%	1.5	1.2	0.952	1.00	1,483	65.0	65.0	22.8	C
B-15	SR-99 NB SR-58 Off to Wible On	AM	4,808	0.92	4	Level	9%	0%	1.5	1.2	0.957	1.00	1,365	65.0	65.0	21.0	C
B-16	SR-99 NB SR-58 to California Ave	AM	6,386	0.92	4	Level	11%	0%	1.5	1.2	0.948	1.00	1,831	65.0	63.6	28.8	D
B-17	SR-99 NB California Ave Off to On	AM	5,255	0.92	4	Level	13%	0%	1.5	1.2	0.939	1.00	1,521	65.0	65.0	23.4	C
B-18	SR-99 NB California Ave to Rosedale Hwy	AM	5,939	0.92	4	Level	12%	0%	1.5	1.2	0.943	1.00	1,711	65.0	64.5	26.5	D
B-19	SR-99 NB Buck Owens Blvd Off to On	AM	3,387	0.86	4	Level	18%	0%	1.5	1.2	0.917	1.00	1,073	65.0	65.0	16.5	B
B-20	SR-99 NB Airport Dr Off to Golden State Blvd On	AM	2,185	0.88	3	Level	26%	0%	1.5	1.2	0.885	1.00	935	65.0	65.0	14.4	B
B-21	SR-99 SB Golden State Ave Off to Airport Dr On	AM	2,953	0.83	3	Level	17%	0%	1.5	1.2	0.922	1.00	1,287	65.0	65.0	19.8	C
B-22	SR-99 SB Airport Dr to Rosedale Hwy	AM	4,062	0.86	4	Level	14%	0%	1.5	1.2	0.935	1.00	1,263	65.0	65.0	19.4	C
B-23	SR-99 SB Rosedale Hwy Off to On	AM	3,477	0.86	4	Level	15%	0%	1.5	1.2	0.930	1.00	1,087	65.0	65.0	16.7	B
B-24	SR-99 SB Rosedale Hwy to California Ave	AM	5,092	0.89	4	Level	13%	0%	1.5	1.2	0.939	1.00	1,523	65.0	65.0	23.4	C
B-25	SR-99 SB California Ave Off to On	AM	4,015	0.89	4	Level	15%	0%	1.5	1.2	0.930	1.00	1,212	65.0	65.0	18.7	C
B-26	SR-99 SB California Ave to SR-58	AM	4,352	0.90	4	Level	15%	0%	1.5	1.2	0.930	1.00	1,300	65.0	65.0	20.0	C
B-27	SR-99 SB SR-58 Off to On	AM	2,885	0.90	4	Level	14%	0%	1.5	1.2	0.935	1.00	857	65.0	65.0	13.2	B
B-28	SR-99 SB Ming Ave Off to On	AM	3,267	0.91	4	Level	15%	0%	1.5	1.2	0.930	1.00	965	65.0	65.0	14.8	B
B-29	SR-99 SB Ming Ave to White Ln	AM	3,512	0.90	3	Level	14%	0%	1.5	1.2	0.935	1.00	1,392	65.0	65.0	21.4	C
B-30	SR-99 SB White Ln Off to On	AM	2,165	0.90	3	Level	19%	0%	1.5	1.2	0.913	1.00	878	65.0	65.0	13.5	B
B-31	SR-99 SB White Ln to Panama Ln	AM	2,415	0.92	3	Level	18%	0%	1.5	1.2	0.917	1.00	954	65.0	65.0	14.7	B

HCM 2000
Merge Ramp Junctions
Capacity Analysis

Jurisdiction Bakersfield, CA Agency or Company TRIP
 Analysis Year Existing (2008) Date 3.3.10
 Analyst BP Project Description Centennial Corridor Study

General Information

Freeway Data

Freeway Volume Adjustment

Freeway/ Direction	On-ramp	Analysis Time Period	Lanes	S _{FF} (mph)	V (vph)	PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	Flow Rate v _P (pcph)
M-1	SR-58 EB Chester Ave On	AM	2	65.0	3,143	0.90	Level	11%	0%	1.5	1.20	0.948	1.00	3,684
M-2	SR-58 EB Union Ave SB On	AM	2	65.0	2,797	0.92	Level	11%	0%	1.5	1.20	0.948	1.00	3,207
M-3	SR-58 EB Union Ave NB On	AM	2	65.0	2,971	0.92	Level	11%	0%	1.5	1.20	0.948	1.00	3,407
M-4	SR-58 WB Brundage Ln On	AM	2	65.0	2,659	0.88	Level	13%	0%	1.5	1.20	0.939	1.00	3,218
M-5	SR-58 WB Union Ave SB On	AM	2	65.0	2,855	0.88	Level	13%	0%	1.5	1.20	0.939	1.00	3,455
M-6	SR-58 WB H St On	AM	2	65.0	2,622	0.88	Level	15%	0%	1.5	1.20	0.930	1.00	3,203
M-7	SR-99 NB White Ln EB On	AM	3	65.0	3,353	0.88	Level	11%	0%	1.5	1.20	0.948	1.00	4,020
M-8	SR-99 NB White Ln WB On	AM	3	65.0	4,924	0.88	Level	10%	0%	1.5	1.20	0.952	1.00	5,875
M-9	SR-99 NB Ming Ave On	AM	4	65.0	5,311	0.94	Level	10%	0%	1.5	1.20	0.952	1.00	5,933
M-10	SR-99 NB Wible On	AM	4	65.0	4,808	0.92	Level	9%	0%	1.5	1.20	0.957	1.00	5,461
M-11	SR-99 NB SR-58 On	AM	4	65.0	5,298	0.92	Level	9%	0%	1.5	1.20	0.957	1.00	6,018
M-12	SR-99 NB California Ave EB On	AM	4	65.0	5,255	0.92	Level	13%	0%	1.5	1.20	0.939	1.00	6,083
M-13	SR-99 NB California Ave WB On	AM	4	65.0	5,711	0.92	Level	13%	0%	1.5	1.20	0.939	1.00	6,611
M-14	SR-99 NB Buck Owens Blvd On	AM	4	65.0	3,387	0.86	Level	18%	0%	1.5	1.20	0.917	1.00	4,293
M-15	SR-99 SB Airport Dr On	AM	4	65.0	2,953	0.83	Level	17%	0%	1.5	1.20	0.922	1.00	3,860
M-16	SR-99 SB Rosedale Hwy WB On	AM	4	65.0	3,477	0.86	Level	15%	0%	1.5	1.20	0.930	1.00	4,346
M-17	SR-99 SB Rosedale Hwy EB On	AM	4	65.0	4,175	0.86	Level	14%	0%	1.5	1.20	0.935	1.00	5,194
M-18	SR-99 SB California Ave On	AM	4	65.0	4,015	0.89	Level	15%	0%	1.5	1.20	0.930	1.00	4,850
M-19	SR-99 SB SR-58 On	AM	4	65.0	2,885	0.90	Level	14%	0%	1.5	1.20	0.935	1.00	3,430
M-20	SR-99 SB Real Rd On	AM	4	65.0	3,823	0.90	Level	13%	0%	1.5	1.20	0.939	1.00	4,524
M-21	SR-99 SB Ming Ave On	AM	3	65.0	3,267	0.91	Level	15%	0%	1.5	1.20	0.930	1.00	3,859
M-22	SR-99 SB White Ln WB On	AM	3	65.0	2,165	0.90	Level	19%	0%	1.5	1.20	0.913	1.00	2,634
M-23	SR-99 SB White Ln EB On	AM	3	65.0	2,276	0.90	Level	19%	0%	1.5	1.20	0.913	1.00	2,769

HCM 2000
Merge Ramp Junctions
Capacity Analysis

General Information			On-Ramp Data					On-Ramp Volume Adjustment										
Freeway/ Direction	On-ramp	Type	Lanes	S _{FR} (mph)	V _R (vph)	Accel Lane (ft)			PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	Flow Rate	
						L _{A1}	L _{A2}	L _{Aeff}									v _D (pcph)	
M-1	SR-58 EB Chester Ave On	Right	1	45.0	475	540		540	0.88	Level	4%	0%	1.5	1.2	0.980	1.00	551	
M-2	SR-58 EB Union Ave SB On	Right	1	25.0	174	480		480	0.81	Level	9%	0%	1.5	1.2	0.957	1.00	224	
M-3	SR-58 EB Union Ave NB On	Right	1	45.0	199	540		540	0.86	Level	13%	0%	1.5	1.2	0.939	1.00	246	
M-4	SR-58 WB Brundage Ln On	Right	1	25.0	196	480		480	0.82	Level	12%	0%	1.5	1.2	0.943	1.00	253	
M-5	SR-58 WB Union Ave SB On	Right	1	25.0	241	540		540	0.84	Level	10%	0%	1.5	1.2	0.952	1.00	301	
M-6	SR-58 WB H St On	Right	1	45.0	333	540		540	0.90	Level	4%	0%	1.5	1.2	0.980	1.00	377	
M-7	SR-99 NB White Ln EB On	Right	1	25.0	1,571	360		360	0.86	Level	8%	0%	1.5	1.2	0.962	1.00	1,900	
M-8	SR-99 NB White Ln WB On	Right	1	45.0	684	530		530	0.86	Level	6%	0%	1.5	1.2	0.971	1.00	819	
M-9	SR-99 NB Ming Ave On	Right	1	45.0	1,265	560		560	0.88	Level	3%	0%	1.5	1.2	0.985	1.00	1,459	
M-10	SR-99 NB Wible On	Right	1	25.0	490	550		550	0.86	Level	4%	0%	1.5	1.2	0.980	1.00	581	
M-11	SR-99 NB SR-58 On	Right	1	55.0	1,088	560		560	0.86	Level	23%	0%	1.5	1.2	0.897	1.00	1,411	
M-12	SR-99 NB California Ave EB On	Right	1	25.0	456	500		500	0.86	Level	5%	0%	1.5	1.2	0.976	1.00	543	
M-13	SR-99 NB California Ave WB On	Right	1	45.0	228	540		540	0.84	Level	7%	0%	1.5	1.2	0.966	1.00	281	
M-14	SR-99 NB Buck Owens Blvd On	Right	1	25.0	306	500		500	0.84	Level	13%	0%	1.5	1.2	0.939	1.00	388	
M-15	SR-99 SB Airport Dr On	Right	1	45.0	1,109	500		500	0.88	Level	5%	0%	1.5	1.2	0.976	1.00	1,292	
M-16	SR-99 SB Rosedale Hwy WB On	Right	1	25.0	698	540		540	0.86	Level	10%	0%	1.5	1.2	0.952	1.00	852	
M-17	SR-99 SB Rosedale Hwy EB On	Right	1	45.0	917	630		630	0.86	Level	8%	0%	1.5	1.2	0.962	1.00	1,109	
M-18	SR-99 SB California Ave On	Right	1	25.0	337	490		490	0.88	Level	3%	0%	1.5	1.2	0.985	1.00	389	
M-19	SR-99 SB SR-58 On	Right	1	25.0	938	610		610	0.88	Level	9%	0%	1.5	1.2	0.957	1.00	1,114	
M-20	SR-99 SB Real Rd On	Right	1	45.0	255	540		540	0.89	Level	2%	0%	1.5	1.2	0.990	1.00	289	
M-21	SR-99 SB Ming Ave On	Right	1	45.0	245	550		550	0.88	Level	4%	0%	1.5	1.2	0.980	1.00	284	
M-22	SR-99 SB White Ln WB On	Right	1	25.0	111	390		390	0.87	Level	9%	0%	1.5	1.2	0.957	1.00	133	
M-23	SR-99 SB White Ln EB On	Right	1	45.0	139	520		520	0.87	Level	7%	0%	1.5	1.2	0.966	1.00	165	

**HCM 2000
Merge Ramp Junctions
Capacity Analysis**

General Information

Adjacent Upstream Ramp Data

Freeway/ Direction	On-ramp	Exists?	Volume			Terrain	Truck/		E _T	E _R	f _{HV}	f _P	Flow Rate v _P (pcph)
			Distance	(vph)	PHF		Bus %	RV %					
M-1	SR-58 EB Chester Ave On	No											
M-2	SR-58 EB Union Ave SB On	No											
M-3	SR-58 EB Union Ave NB On	No											
M-4	SR-58 WB Brundage Ln On	No											
M-5	SR-58 WB Union Ave SB On	No											
M-6	SR-58 WB H St On	No											
M-7	SR-99 NB White Ln EB On	Off	1,250	202	0.87	Level	8%	0%	1.5	1.2	0.962	1.00	241
M-8	SR-99 NB White Ln WB On	On	680	1,571	0.86	Level	8%	0%	1.5	1.2	0.962	1.00	1,900
M-9	SR-99 NB Ming Ave On	No											
M-10	SR-99 NB Wible On	No											
M-11	SR-99 NB SR-58 On	No											
M-12	SR-99 NB California Ave EB On	No											
M-13	SR-99 NB California Ave WB On	No											
M-14	SR-99 NB Buck Owens Blvd On	No											
M-15	SR-99 SB Airport Dr On	No											
M-16	SR-99 SB Rosedale Hwy WB On	No											
M-17	SR-99 SB Rosedale Hwy EB On	No											
M-18	SR-99 SB California Ave On	No											
M-19	SR-99 SB SR-58 On	No											
M-20	SR-99 SB Real Rd On	No											
M-21	SR-99 SB Ming Ave On	Off	2,870	811	0.88	Level	3%	0%	1.5	1.2	0.985	1.00	935
M-22	SR-99 SB White Ln WB On	Off	1,520	1,347	0.86	Level	5%	0%	1.5	1.2	0.976	1.00	1,605
M-23	SR-99 SB White Ln EB On	On	600	111	0.87	Level	9%	0%	1.5	1.2	0.957	1.00	133

HCM 2000
Merge Ramp Junctions
Capacity Analysis

General Information			Adjacent Downstream Ramp Data											v ₁₂ Estimation						
Freeway/ Direction	On-ramp	Exists?	Distance	Volume (vph)	PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _p	Flow Rate v _p (pcph)	L _{EQ}		P _{FM} Equations			P _{FM}	v ₁₂ (pcph)
														25-2	25-3	1	2	3		
M-1	SR-58 EB	Chester Ave On	No														0.593		1.000	3,684
M-2	SR-58 EB	Union Ave SB On	No														0.591		1.000	3,207
M-3	SR-58 EB	Union Ave NB On	No														0.593		1.000	3,407
M-4	SR-58 WB	Brundage Ln On	No														0.591		1.000	3,218
M-5	SR-58 WB	Union Ave SB On	No														0.593		1.000	3,455
M-6	SR-58 WB	H St On	No														0.593		1.000	3,203
M-7	SR-99 NB	White Ln EB On	On	680	684	0.86	Level	6%	0%	1.5	1.2	0.971	1.00	819	332	5,531	0.588	0.724	0.588	2,362
M-8	SR-99 NB	White Ln WB On	No												1,619		0.592		0.592	3,480
M-9	SR-99 NB	Ming Ave On	No														0.593		0.174	1,033
M-10	SR-99 NB	Wible On	No														0.593		0.390	2,132
M-11	SR-99 NB	SR-58 On	No														0.593		0.155	933
M-12	SR-99 NB	California Ave EB On	No														0.592		0.373	2,268
M-13	SR-99 NB	California Ave WB On	No														0.593		0.316	2,092
M-14	SR-99 NB	Buck Owens Blvd On	No														0.592		0.392	1,684
M-15	SR-99 SB	Airport Dr On	No														0.592		0.180	696
M-16	SR-99 SB	Rosedale Hwy WB On	No														0.593		0.352	1,530
M-17	SR-99 SB	Rosedale Hwy EB On	No														0.595		0.235	1,222
M-18	SR-99 SB	California Ave On	No														0.591		0.388	1,880
M-19	SR-99 SB	SR-58 On	No														0.595		0.351	1,203
M-20	SR-99 SB	Real Rd On	No														0.593		0.315	1,427
M-21	SR-99 SB	Ming Ave On	No												1,082		0.593	0.850	0.593	2,288
M-22	SR-99 SB	White Ln WB On	On	600	139	0.87	Level	7%	0%	1.5	1.2	0.966	1.00	165	-330	1,093	0.588	0.784	0.588	1,550
M-23	SR-99 SB	White Ln EB On	No												810		0.592		0.592	1,639

HCM 2000
Merge Ramp Junctions
Capacity Analysis

General Information

Capacity Checks

Freeway/ Direction	On-ramp	V _{F1}			V _{F0}			V ₃ , V _{av34}			V _{12a}		
		(pcph)	Max V _{F1} (pcph)	LOS F?	(pcph)	Max V _{F0} (pcph)	LOS F?	(pcphpl)	> 2,700?	> 1.5*V ₁₂ /2?	(pcph)	V _{R12a} (pcph)	Max V _{R12a} (pcph)
M-1	SR-58 EB Chester Ave On	3,684	4,800	No	4,235	4,800	No	0	No	No	3,684	4,235	4,600
M-2	SR-58 EB Union Ave SB On	3,207	4,800	No	3,432	4,800	No	0	No	No	3,207	3,432	4,600
M-3	SR-58 EB Union Ave NB On	3,407	4,800	No	3,653	4,800	No	0	No	No	3,407	3,653	4,600
M-4	SR-58 WB Brundage Ln On	3,218	4,800	No	3,471	4,800	No	0	No	No	3,218	3,471	4,600
M-5	SR-58 WB Union Ave SB On	3,455	4,800	No	3,756	4,800	No	0	No	No	3,455	3,756	4,600
M-6	SR-58 WB H St On	3,203	4,800	No	3,580	4,800	No	0	No	No	3,203	3,580	4,600
M-7	SR-99 NB White Ln EB On	4,020	7,200	No	5,920	7,200	No	1,658	No	No	2,362	4,262	4,600
M-8	SR-99 NB White Ln WB On	5,875	7,200	No	6,694	7,200	No	2,395	No	No	3,480	4,299	4,600
M-9	SR-99 NB Ming Ave On	5,933	9,600	No	7,392	9,600	No	2,450	No	Yes	2,373	3,832	4,600
M-10	SR-99 NB Wible On	5,461	9,600	No	6,042	9,600	No	1,664	No	Yes	2,185	2,766	4,600
M-11	SR-99 NB SR-58 On	6,018	9,600	No	7,428	9,600	No	2,543	No	Yes	2,407	3,818	4,600
M-12	SR-99 NB California Ave EB On	6,083	9,600	No	6,627	9,600	No	1,908	No	Yes	2,433	2,977	4,600
M-13	SR-99 NB California Ave WB On	6,611	9,600	No	6,892	9,600	No	2,259	No	Yes	2,644	2,925	4,600
M-14	SR-99 NB Buck Owens Blvd On	4,293	9,600	No	4,681	9,600	No	1,304	No	Yes	1,717	2,105	4,600
M-15	SR-99 SB Airport Dr On	3,860	9,600	No	5,152	9,600	No	1,582	No	Yes	1,544	2,836	4,600
M-16	SR-99 SB Rosedale Hwy WB On	4,346	9,600	No	5,198	9,600	No	1,408	No	Yes	1,739	2,591	4,600
M-17	SR-99 SB Rosedale Hwy EB On	5,194	9,600	No	6,303	9,600	No	1,986	No	Yes	2,078	3,187	4,600
M-18	SR-99 SB California Ave On	4,850	9,600	No	5,238	9,600	No	1,485	No	Yes	1,940	2,329	4,600
M-19	SR-99 SB SR-58 On	3,430	9,600	No	4,544	9,600	No	1,114	No	Yes	1,372	2,486	4,600
M-20	SR-99 SB Real Rd On	4,524	9,600	No	4,813	9,600	No	1,548	No	Yes	1,810	2,099	4,600
M-21	SR-99 SB Ming Ave On	3,859	7,200	No	4,143	7,200	No	1,571	No	No	2,288	2,572	4,600
M-22	SR-99 SB White Ln WB On	2,634	7,200	No	2,767	7,200	No	1,084	No	No	1,550	1,683	4,600
M-23	SR-99 SB White Ln EB On	2,769	7,200	No	2,934	7,200	No	1,130	No	No	1,639	1,805	4,600

HCM 2000
Merge Ramp Junctions
Capacity Analysis

General Information

Results

Speed Estimation

Freeway/ Direction	On-ramp	v_R (pcph)	Max v_R (pcph)	LOS F?	Density, D (pcplpm)	Level of Service	Int. Var. M_S	Inf. Area S_R (mph)	Out Lns. S_O (mph)	All vehs. S (mph)
M-1	SR-58 EB Chester Ave On	551	2,100	No	34.9	D	0.542	52.5	0.0	52.5
M-2	SR-58 EB Union Ave SB On	224	1,900	No	29.1	D	0.418	55.4	0.0	55.4
M-3	SR-58 EB Union Ave NB On	246	2,100	No	30.5	D	0.423	55.3	0.0	55.3
M-4	SR-58 WB Brundage Ln On	253	1,900	No	29.4	D	0.423	55.3	0.0	55.3
M-5	SR-58 WB Union Ave SB On	301	1,900	No	31.3	D	0.461	54.4	0.0	54.4
M-6	SR-58 WB H St On	377	2,100	No	29.8	D	0.412	55.5	0.0	55.5
M-7	SR-99 NB White Ln EB On	1,900	1,900	No	35.6	E	0.580	51.7	60.8	53.9
M-8	SR-99 NB White Ln WB On	819	2,100	No	35.3	E	0.561	52.1	57.9	54.0
M-9	SR-99 NB Ming Ave On	1,459	2,100	No	31.2	D	0.451	54.6	60.4	57.3
M-10	SR-99 NB Wible On	581	1,900	No	23.3	C	0.355	56.8	60.9	59.0
M-11	SR-99 NB SR-58 On	1,411	2,200	No	31.1	D	0.437	55.0	60.3	57.4
M-12	SR-99 NB California Ave EB On	543	1,900	No	25.3	C	0.373	56.4	60.2	58.5
M-13	SR-99 NB California Ave WB On	281	2,100	No	24.8	C	0.345	57.1	59.7	58.5
M-14	SR-99 NB Buck Owens Blvd On	388	1,900	No	18.6	B	0.328	57.5	62.2	60.0
M-15	SR-99 SB Airport Dr On	1,292	2,100	No	23.9	C	0.342	57.1	62.6	59.5
M-16	SR-99 SB Rosedale Hwy WB On	852	1,900	No	21.9	C	0.346	57.0	62.1	59.5
M-17	SR-99 SB Rosedale Hwy EB On	1,109	2,100	No	25.9	C	0.359	56.7	61.2	58.9
M-18	SR-99 SB California Ave On	389	1,900	No	20.4	C	0.337	57.3	61.6	59.6
M-19	SR-99 SB SR-58 On	1,114	1,900	No	20.5	C	0.337	57.2	63.1	59.8
M-20	SR-99 SB Real Rd On	289	2,100	No	18.3	B	0.304	58.0	61.9	60.1
M-21	SR-99 SB Ming Ave On	284	2,100	No	22.0	C	0.323	57.6	61.1	58.9
M-22	SR-99 SB White Ln WB On	133	1,900	No	16.1	B	0.322	57.6	62.9	59.6
M-23	SR-99 SB White Ln EB On	165	2,100	No	16.2	B	0.298	58.1	62.7	59.8

HCM 2000
Diverge Ramp Junctions
Capacity Analysis

Jurisdiction Bakersfield, CA Agency or Company TRIP
 Analysis Year Existing (2008) Date 3.3.10
 Analyst BP Project Description Centennial Corridor Study

General Information

Freeway Data

Freeway Volume Adjustment

Freeway/ Direction	Off-ramp	Analysis Time Period	S _{FF}		V (vph)	PHF	Terrain	Truck/ Bus %						Flow Rate	
			Lanes	(mph)				Bus %	RV %	E _T	E _R	f _{HV}	f _P	v _P (pcph)	
D-2	SR-58 EB Union Ave Off	AM	2	65.0	3,618	0.92	Level	10%	0%	1.5	1.20	0.952	1.00	4,129	
D-3	SR-58 WB Brundage Ln Off	AM	2	65.0	3,168	0.88	Level	12%	0%	1.5	1.20	0.943	1.00	3,816	
D-4	SR-58 WB Chester Ave Off	AM	2	65.0	3,096	0.88	Level	13%	0%	1.5	1.20	0.939	1.00	3,747	
D-5	SR-58 WB SR-99 NB Off	AM	2	65.0	2,955	0.88	Level	13%	0%	1.5	1.20	0.939	1.00	3,576	
D-6	SR-58 WB SR-99 SB Off	AM	2	65.0	1,867	0.88	Level	8%	0%	1.5	1.20	0.962	1.00	2,206	
D-7	SR-99 NB White Ln Off	AM	3	65.0	3,555	0.88	Level	11%	0%	1.5	1.20	0.948	1.00	4,262	
D-8	SR-99 NB Ming Ave Off	AM	4	65.0	5,608	0.94	Level	10%	0%	1.5	1.20	0.952	1.00	6,264	
D-9	SR-99 NB SR-58 Off	AM	4	65.0	6,576	0.93	Level	9%	0%	1.5	1.20	0.957	1.00	7,389	
D-10	SR-99 NB California Ave Off	AM	4	65.0	6,386	0.92	Level	11%	0%	1.5	1.20	0.948	1.00	7,323	
D-11	SR-99 NB Rosedale Hwy Off	AM	4	65.0	5,939	0.92	Level	12%	0%	1.5	1.20	0.943	1.00	6,843	
D-12	SR-99 NB Buck Owens Blvd Off	AM	4	65.0	4,209	0.92	Level	15%	0%	1.5	1.20	0.930	1.00	4,918	
D-13	SR-99 NB Airport Dr Off	AM	4	65.0	3,693	0.86	Level	17%	0%	1.5	1.20	0.922	1.00	4,659	
D-14	SR-99 SB Rosedale Hwy Off	AM	4	65.0	4,062	0.86	Level	14%	0%	1.5	1.20	0.935	1.00	5,054	
D-15	SR-99 SB California Ave Off	AM	4	65.0	5,092	0.89	Level	13%	0%	1.5	1.20	0.939	1.00	6,093	
D-16	SR-99 SB SR-58 Off	AM	4	65.0	4,352	0.90	Level	15%	0%	1.5	1.20	0.930	1.00	5,198	
D-17	SR-99 SB Ming Ave Off	AM	4	65.0	4,078	0.91	Level	12%	0%	1.5	1.20	0.943	1.00	4,750	
D-18	SR-99 SB White Ln Off	AM	3	65.0	3,512	0.90	Level	14%	0%	1.5	1.20	0.935	1.00	4,175	

HCM 2000
Diverge Ramp Junctions
Capacity Analysis

General Information			Off-Ramp Data						Off-Ramp Volume Adjustment												
Freeway/ Direction			Off-ramp		Type	Lanes	S _{FR} (mph)	V _R (vph)	Decel Lane (ft)			PHF	Terrain	Truck/ Bus %		RV %	E _T	E _R	f _{HV}	f _P	Flow Rate v _D (pcph)
D-2	SR-58 EB	Union Ave Off	Right	1	45.0	821	140	140				0.90	Level	4%	0%	1.5	1.2	0.980	1.00	930	
D-3	SR-58 WB	Brundage Ln Off	Right	1	25.0	509	150	150				0.88	Level	8%	0%	1.5	1.2	0.962	1.00	602	
D-4	SR-58 WB	Chester Ave Off	Right	1	45.0	474	140	140				0.86	Level	4%	0%	1.5	1.2	0.980	1.00	562	
D-5	SR-58 WB	SR-99 NB Off	Right	1	55.0	1,088	160	160				0.86	Level	23%	0%	1.5	1.2	0.897	1.00	1,411	
D-6	SR-58 WB	SR-99 SB Off	Right	1	25.0	938	110	110				0.88	Level	9%	0%	1.5	1.2	0.957	1.00	1,114	
D-7	SR-99 NB	White Ln Off	Right	1	45.0	202	140	140				0.87	Level	8%	0%	1.5	1.2	0.962	1.00	241	
D-8	SR-99 NB	Ming Ave Off	Right	1	25.0	297	200	200				0.88	Level	5%	0%	1.5	1.2	0.976	1.00	346	
D-9	SR-99 NB	SR-58 Off	Right	1	55.0	1,768	140	140				0.90	Level	7%	0%	1.5	1.2	0.966	1.00	2,033	
D-10	SR-99 NB	California Ave Off	Right	1	45.0	1,131	140	140				0.88	Level	2%	0%	1.5	1.2	0.990	1.00	1,298	
D-11	SR-99 NB	Rosedale Hwy Off	Right	1	45.0	1,730	140	140				0.90	Level	5%	0%	1.5	1.2	0.976	1.00	1,970	
D-12	SR-99 NB	Buck Owens Blvd Off	Right	1	25.0	822	140	140				0.84	Level	7%	0%	1.5	1.2	0.966	1.00	1,013	
D-13	SR-99 NB	Airport Dr Off	Right	1	45.0	1,508	300	300				0.84	Level	4%	0%	1.5	1.2	0.980	1.00	1,831	
D-14	SR-99 SB	Rosedale Hwy Off	Right	1	45.0	585	140	140				0.86	Level	8%	0%	1.5	1.2	0.962	1.00	707	
D-15	SR-99 SB	California Ave Off	Right	1	45.0	1,077	140	140				0.88	Level	2%	0%	1.5	1.2	0.990	1.00	1,236	
D-16	SR-99 SB	SR-58 Off	Right	1	55.0	1,467	160	160				0.88	Level	15%	0%	1.5	1.2	0.930	1.00	1,792	
D-17	SR-99 SB	Ming Ave Off	Right	1	45.0	811	210	210				0.88	Level	3%	0%	1.5	1.2	0.985	1.00	935	
D-18	SR-99 SB	White Ln Off	Right	2	45.0	1,347	140	1,150	1,430			0.86	Level	5%	0%	1.5	1.2	0.976	1.00	1,605	

**HCM 2000
Diverge Ramp Junctions
Capacity Analysis**

General Information

Adjacent Upstream Ramp Data

Freeway/ Direction			Off-ramp		Volume				Truck/ Bus %						Flow Rate
			Exists?	Distance	(vph)	PHF	Terrain	Bus %	RV %	E _T	E _R	f _{HV}	f _P	v _p (pcph)	
D-2	SR-58 EB	Union Ave Off	No												
D-3	SR-58 WB	Brundage Ln Off	No												
D-4	SR-58 WB	Chester Ave Off	No												
D-5	SR-58 WB	SR-99 NB Off	No												
D-6	SR-58 WB	SR-99 SB Off	No												
D-7	SR-99 NB	White Ln Off	No												
D-8	SR-99 NB	Ming Ave Off	No												
D-9	SR-99 NB	SR-58 Off	No												
D-10	SR-99 NB	California Ave Off	No												
D-11	SR-99 NB	Rosedale Hwy Off	No												
D-12	SR-99 NB	Buck Owens Blvd Off	No												
D-13	SR-99 NB	Airport Dr Off	No												
D-14	SR-99 SB	Rosedale Hwy Off	No												
D-15	SR-99 SB	California Ave Off	No												
D-16	SR-99 SB	SR-58 Off	No												
D-17	SR-99 SB	Ming Ave Off	No												
D-18	SR-99 SB	White Ln Off	On	5,270	243	0.88	Level	4%	0%	1.5	1.2	0.980	1.00	282	

HCM 2000
Diverge Ramp Junctions
Capacity Analysis

General Information			Adjacent Downstream Ramp Data											V ₁₂ Estimation			
Freeway/ Direction	Off-ramp	Exists?	Distance	Volume (vph)	PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _p	Flow Rate v _p (pcph)	L _{EQ}		P _{FD}	V ₁₂ (pcph)
D-2	SR-58 EB Union Ave Off	No														1.000	4,129
D-3	SR-58 WB Brundage Ln Off	No														1.000	3,816
D-4	SR-58 WB Chester Ave Off	No														1.000	3,747
D-5	SR-58 WB SR-99 NB Off	No														1.000	3,576
D-6	SR-58 WB SR-99 SB Off	No														1.000	2,206
D-7	SR-99 NB White Ln Off	On	1,250	1,571	0.86	Level	8%	0%	1.5	1.2	0.962	1.00	1,900	2,055	0.642	0.436	2,824
D-8	SR-99 NB Ming Ave Off	No														0.436	2,926
D-9	SR-99 NB SR-58 Off	No														0.436	4,368
D-10	SR-99 NB California Ave Off	No														0.436	3,925
D-11	SR-99 NB Rosedale Hwy Off	No														0.436	4,095
D-12	SR-99 NB Buck Owens Blvd Off	No														0.436	2,716
D-13	SR-99 NB Airport Dr Off	No														0.436	3,064
D-14	SR-99 SB Rosedale Hwy Off	No														0.436	2,602
D-15	SR-99 SB California Ave Off	No														0.436	3,354
D-16	SR-99 SB SR-58 Off	No														0.436	3,277
D-17	SR-99 SB Ming Ave Off	No														0.436	2,599
D-18	SR-99 SB White Ln Off	On	1,520	111	0.87	Level	9%	0%	1.5	1.2	0.957	1.00	133	6,256	314	0.450	2,762

HCM 2000
Diverge Ramp Junctions
Capacity Analysis

General Information

Capacity Checks

Freeway/ Direction	Off-ramp	V _{FI} (pcph)	Max V _{FI} (pcph)	LOS F?	V ₃ , V _{av34} (pcphpl)	V ₃ , V _{av34} > 2,700?	V ₃ , V _{av34} > 1.5*V ₁₂ /2?	V _{12a} (pcph)	Max V ₁₂ (pcph)	LOS F?	V _{FO} (pcph)	Max V _{FO} (pcph)	LOS F?
D-2	SR-58 EB Union Ave Off	4,129	4,800	No	0	No	No	4,129	4,400	No	3,199	4,800	No
D-3	SR-58 WB Brundage Ln Off	3,816	4,800	No	0	No	No	3,816	4,400	No	3,214	4,800	No
D-4	SR-58 WB Chester Ave Off	3,747	4,800	No	0	No	No	3,747	4,400	No	3,185	4,800	No
D-5	SR-58 WB SR-99 NB Off	3,576	4,800	No	0	No	No	3,576	4,400	No	2,166	4,800	No
D-6	SR-58 WB SR-99 SB Off	2,206	4,800	No	0	No	No	2,206	4,400	No	1,093	4,800	No
D-7	SR-99 NB White Ln Off	4,262	7,200	No	1,438	No	No	2,824	4,400	No	4,020	7,200	No
D-8	SR-99 NB Ming Ave Off	6,264	9,600	No	1,669	No	No	2,926	4,400	No	5,918	9,600	No
D-9	SR-99 NB SR-58 Off	7,389	9,600	No	1,510	No	No	4,368	4,400	No	5,356	9,600	No
D-10	SR-99 NB California Ave Off	7,323	9,600	No	1,699	No	No	3,925	4,400	No	6,025	9,600	No
D-11	SR-99 NB Rosedale Hwy Off	6,843	9,600	No	1,374	No	No	4,095	4,400	No	4,872	9,600	No
D-12	SR-99 NB Buck Owens Blvd Off	4,918	9,600	No	1,101	No	No	2,716	4,400	No	3,905	9,600	No
D-13	SR-99 NB Airport Dr Off	4,659	9,600	No	798	No	No	3,064	4,400	No	2,828	9,600	No
D-14	SR-99 SB Rosedale Hwy Off	5,054	9,600	No	1,226	No	No	2,602	4,400	No	4,346	9,600	No
D-15	SR-99 SB California Ave Off	6,093	9,600	No	1,370	No	No	3,354	4,400	No	4,857	9,600	No
D-16	SR-99 SB SR-58 Off	5,198	9,600	No	961	No	No	3,277	4,400	No	3,406	9,600	No
D-17	SR-99 SB Ming Ave Off	4,750	9,600	No	1,076	No	No	2,599	4,400	No	3,815	9,600	No
D-18	SR-99 SB White Ln Off	4,175	7,200	No	1,413	No	No	2,762	4,400	No	2,570	7,200	No

**HCM 2000
Diverge Ramp Junctions
Capacity Analysis**

General Information

Results

Speed Estimation

Freeway/ Direction	Off-ramp	v_R (pcph)	Max v_R (pcph)	LOS F?	Density, D (pcplpm)	Level of Service	Int. Var. D_s	Inf. Area S_R (mph)	Out Lns. S_O (mph)	All vehs. S (mph)
D-2	SR-58 EB Union Ave Off	930	2,100	No	38.5	E	0.382	56.2	0.0	56.2
D-3	SR-58 WB Brundage Ln Off	602	1,900	No	35.7	E	0.612	50.9	0.0	50.9
D-4	SR-58 WB Chester Ave Off	562	2,100	No	35.2	E	0.349	57.0	0.0	57.0
D-5	SR-58 WB SR-99 NB Off	1,411	2,200	No	33.6	D	0.295	58.2	0.0	58.2
D-6	SR-58 WB SR-99 SB Off	1,114	1,900	No	22.2	C	0.658	49.9	0.0	49.9
D-7	SR-99 NB White Ln Off	241	2,100	No	27.3	C	0.320	57.6	69.6	61.2
D-8	SR-99 NB Ming Ave Off	346	1,900	No	27.6	C	0.589	51.4	68.7	59.4
D-9	SR-99 NB SR-58 Off	2,033	2,200	No	40.6	E	0.351	56.9	69.3	61.4
D-10	SR-99 NB California Ave Off	1,298	2,100	No	36.7	E	0.415	55.5	68.6	60.9
D-11	SR-99 NB Rosedale Hwy Off	1,970	2,100	No	38.2	E	0.475	54.1	69.8	59.5
D-12	SR-99 NB Buck Owens Blvd Off	1,013	1,900	No	26.3	C	0.649	50.1	70.9	57.7
D-13	SR-99 NB Airport Dr Off	1,831	2,100	No	27.9	C	0.463	54.4	71.3	59.2
D-14	SR-99 SB Rosedale Hwy Off	707	2,100	No	25.4	C	0.362	56.7	70.4	62.6
D-15	SR-99 SB California Ave Off	1,236	2,100	No	31.8	D	0.409	55.6	69.9	61.2
D-16	SR-99 SB SR-58 Off	1,792	2,200	No	31.0	D	0.329	57.4	71.3	61.9
D-17	SR-99 SB Ming Ave Off	935	2,100	No	24.7	C	0.382	56.2	71.0	62.1
D-18	SR-99 SB White Ln Off	1,605	4,100	No	15.1	B	0.442	54.8	69.7	59.1

HCM 2000
Basic Freeway Segments
Capacity Analysis

Jurisdiction Bakersfield, CA
 Analysis Year Existing (2008)
 Analyst BP

Agency or Company TRIP
 Date 3.3.10
 Project Description Centennial Corridor Study

General Information

Flow Rate Calculation

Speed Calculation

Results

Freeway/ Direction	From/To	Analysis Time Period	Volume (vph)	PHF	Lanes	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	Flow Rate v _P (pcphpl)	Measured FFS (mph)	S (mph)	Density, D (pcplpm)	Level of Service
B-2	SR-58 EB H St Off to Chester Ave On	PM	3,003	0.92	2	Level	13%	0%	1.5	1.2	0.939	1.00	1,738	65.0	64.3	27.0	D
B-3	SR-58 EB Chester Ave to Union Ave	PM	3,562	0.92	2	Level	11%	0%	1.5	1.2	0.948	1.00	2,042	65.0	60.7	33.7	D
B-4	SR-58 EB Union Ave Off to On	PM	3,005	0.90	2	Level	11%	0%	1.5	1.2	0.948	1.00	1,761	65.0	64.2	27.4	D
B-5	SR-58 EB Union Ave to Cottonwood Rd	PM	3,469	0.90	2	Level	10%	0%	1.5	1.2	0.952	1.00	2,024	65.0	61.0	33.2	D
B-6	SR-58 WB Cottonwood Rd to Union Ave	PM	3,053	0.92	2	Level	9%	0%	1.5	1.2	0.957	1.00	1,734	65.0	64.4	26.9	D
B-7	SR-58 WB Brundage Ln Off to On	PM	2,703	0.92	2	Level	9%	0%	1.5	1.2	0.957	1.00	1,535	65.0	65.0	23.6	C
B-8	SR-58 WB Chester Ave Off to H St On	PM	2,832	0.92	2	Level	9%	0%	1.5	1.2	0.957	1.00	1,608	65.0	64.9	24.8	C
B-9	SR-58 WB H St to SR-99	PM	3,291	0.92	2	Level	8%	0%	1.5	1.2	0.962	1.00	1,860	65.0	63.3	29.4	D
B-10	SR-58 WB SR-99 NB Off to SB Off	PM	2,207	0.92	2	Level	2%	0%	1.5	1.2	0.990	1.00	1,211	65.0	65.0	18.6	C
B-11	SR-99 NB Panama Ln to White Ln	PM	2,448	0.90	3	Level	16%	0%	1.5	1.2	0.926	1.00	979	65.0	65.0	15.1	B
B-12	SR-99 NB White Ln Off to On	PM	2,110	0.90	3	Level	18%	0%	1.5	1.2	0.917	1.00	852	65.0	65.0	13.1	B
B-13	SR-99 NB White Ln to Ming Ave	PM	3,722	0.94	3	Level	12%	0%	1.5	1.2	0.943	1.00	1,399	65.0	65.0	21.5	C
B-14	SR-99 NB Ming Ave Off to On	PM	3,319	0.93	4	Level	13%	0%	1.5	1.2	0.939	1.00	950	65.0	65.0	14.6	B
B-15	SR-99 NB SR-58 Off to Wible On	PM	3,097	0.93	4	Level	12%	0%	1.5	1.2	0.943	1.00	882	65.0	65.0	13.6	B
B-16	SR-99 NB SR-58 to California Ave	PM	4,742	0.93	4	Level	13%	0%	1.5	1.2	0.939	1.00	1,358	65.0	65.0	20.9	C
B-17	SR-99 NB California Ave Off to On	PM	4,064	0.93	4	Level	14%	0%	1.5	1.2	0.935	1.00	1,169	65.0	65.0	18.0	B
B-18	SR-99 NB California Ave to Rosedale Hwy	PM	4,990	0.92	4	Level	12%	0%	1.5	1.2	0.943	1.00	1,437	65.0	65.0	22.1	C
B-19	SR-99 NB Buck Owens Blvd Off to On	PM	2,926	0.89	4	Level	15%	0%	1.5	1.2	0.930	1.00	884	65.0	65.0	13.6	B
B-20	SR-99 NB Airport Dr Off to Golden State Blvd On	PM	2,194	0.87	3	Level	20%	0%	1.5	1.2	0.909	1.00	925	65.0	65.0	14.2	B
B-21	SR-99 SB Golden State Ave Off to Airport Dr On	PM	3,150	0.89	3	Level	17%	0%	1.5	1.2	0.922	1.00	1,280	65.0	65.0	19.7	C
B-22	SR-99 SB Airport Dr to Rosedale Hwy	PM	4,875	0.88	4	Level	12%	0%	1.5	1.2	0.943	1.00	1,468	65.0	65.0	22.6	C
B-23	SR-99 SB Rosedale Hwy Off to On	PM	4,242	0.88	4	Level	12%	0%	1.5	1.2	0.943	1.00	1,277	65.0	65.0	19.7	C
B-24	SR-99 SB Rosedale Hwy to California Ave	PM	6,700	0.92	4	Level	10%	0%	1.5	1.2	0.952	1.00	1,912	65.0	62.7	30.5	D
B-25	SR-99 SB California Ave Off to On	PM	5,673	0.92	4	Level	12%	0%	1.5	1.2	0.943	1.00	1,634	65.0	64.8	25.2	C
B-26	SR-99 SB California Ave to SR-58	PM	6,518	0.92	4	Level	10%	0%	1.5	1.2	0.952	1.00	1,860	65.0	63.3	29.4	D
B-27	SR-99 SB SR-58 Off to On	PM	4,622	0.92	4	Level	8%	0%	1.5	1.2	0.962	1.00	1,306	65.0	65.0	20.1	C
B-28	SR-99 SB Ming Ave Off to On	PM	4,470	0.92	4	Level	9%	0%	1.5	1.2	0.957	1.00	1,269	65.0	65.0	19.5	C
B-29	SR-99 SB Ming Ave to White Ln	PM	4,928	0.89	3	Level	8%	0%	1.5	1.2	0.962	1.00	1,920	65.0	62.6	30.6	D
B-30	SR-99 SB White Ln Off to On	PM	2,899	0.89	3	Level	12%	0%	1.5	1.2	0.943	1.00	1,151	65.0	65.0	17.7	B
B-31	SR-99 SB White Ln to Panama Ln	PM	3,176	0.90	3	Level	11%	0%	1.5	1.2	0.948	1.00	1,241	65.0	65.0	19.1	C

HCM 2000
Merge Ramp Junctions
Capacity Analysis

Jurisdiction Bakersfield, CA Agency or Company TRIP
 Analysis Year Existing (2008) Date 3.3.10
 Analyst BP Project Description Centennial Corridor Study

General Information

Freeway Data

Freeway Volume Adjustment

Freeway/ Direction	On-ramp	Analysis Time Period	Lanes	S _{FF} (mph)	V (vph)	PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	Flow Rate v _P (pcph)
M-1	SR-58 EB Chester Ave On	PM	2	65.0	3,003	0.92	Level	13%	0%	1.5	1.2	0.939	1.00	3,476
M-2	SR-58 EB Union Ave SB On	PM	2	65.0	3,005	0.90	Level	11%	0%	1.5	1.2	0.948	1.00	3,523
M-3	SR-58 EB Union Ave NB On	PM	2	65.0	3,226	0.90	Level	10%	0%	1.5	1.2	0.952	1.00	3,764
M-4	SR-58 WB Brundage Ln On	PM	2	65.0	2,703	0.92	Level	9%	0%	1.5	1.2	0.957	1.00	3,070
M-5	SR-58 WB Union Ave SB On	PM	2	65.0	2,952	0.92	Level	8%	0%	1.5	1.2	0.962	1.00	3,337
M-6	SR-58 WB H St On	PM	2	65.0	2,832	0.92	Level	9%	0%	1.5	1.2	0.957	1.00	3,217
M-7	SR-99 NB White Ln EB On	PM	3	65.0	2,110	0.90	Level	18%	0%	1.5	1.2	0.917	1.00	2,555
M-8	SR-99 NB White Ln WB On	PM	3	65.0	3,265	0.90	Level	13%	0%	1.5	1.2	0.939	1.00	3,864
M-9	SR-99 NB Ming Ave On	PM	4	65.0	3,319	0.93	Level	13%	0%	1.5	1.2	0.939	1.00	3,801
M-10	SR-99 NB Wible On	PM	4	65.0	3,097	0.93	Level	12%	0%	1.5	1.2	0.943	1.00	3,530
M-11	SR-99 NB SR-58 On	PM	4	65.0	3,658	0.93	Level	11%	0%	1.5	1.2	0.948	1.00	4,150
M-12	SR-99 NB California Ave EB On	PM	4	65.0	4,064	0.93	Level	14%	0%	1.5	1.2	0.935	1.00	4,676
M-13	SR-99 NB California Ave WB On	PM	4	65.0	4,693	0.93	Level	13%	0%	1.5	1.2	0.939	1.00	5,374
M-14	SR-99 NB Buck Owens Blvd On	PM	4	65.0	2,926	0.89	Level	15%	0%	1.5	1.2	0.930	1.00	3,534
M-15	SR-99 SB Airport Dr On	PM	4	65.0	3,150	0.89	Level	17%	0%	1.5	1.2	0.922	1.00	3,840
M-16	SR-99 SB Rosedale Hwy WB On	PM	4	65.0	4,242	0.88	Level	12%	0%	1.5	1.2	0.943	1.00	5,110
M-17	SR-99 SB Rosedale Hwy EB On	PM	4	65.0	5,509	0.88	Level	11%	0%	1.5	1.2	0.948	1.00	6,605
M-18	SR-99 SB California Ave On	PM	4	65.0	5,673	0.92	Level	12%	0%	1.5	1.2	0.943	1.00	6,536
M-19	SR-99 SB SR-58 On	PM	4	65.0	4,622	0.92	Level	8%	0%	1.5	1.2	0.962	1.00	5,225
M-20	SR-99 SB Real Rd On	PM	4	65.0	5,746	0.92	Level	7%	0%	1.5	1.2	0.966	1.00	6,464
M-21	SR-99 SB Ming Ave On	PM	3	65.0	4,470	0.92	Level	9%	0%	1.5	1.2	0.957	1.00	5,077
M-22	SR-99 SB White Ln WB On	PM	3	65.0	2,899	0.89	Level	12%	0%	1.5	1.2	0.943	1.00	3,453
M-23	SR-99 SB White Ln EB On	PM	3	65.0	3,038	0.89	Level	11%	0%	1.5	1.2	0.948	1.00	3,601

HCM 2000
Merge Ramp Junctions
Capacity Analysis

General Information

On-Ramp Data

On-Ramp Volume Adjustment

Freeway/ Direction			On-ramp		S _{FR}	V _R	Accel Lane (ft)			Truck/ Flow Rate									
Type	Lanes	(mph)	(vph)	L _{A1}	L _{A2}	L _{Aeff}	PHF	Terrain	Bus %	RV %	E _T	E _R	f _{HV}	f _P	v _p (pcph)				
M-1	SR-58 EB	Chester Ave On	Right	1	45.0	559	540	540	0.90	Level	3%	0%	1.5	1.2	0.985	1.00	630		
M-2	SR-58 EB	Union Ave SB On	Right	1	25.0	221	480	480	0.91	Level	3%	0%	1.5	1.2	0.985	1.00	247		
M-3	SR-58 EB	Union Ave NB On	Right	1	45.0	243	540	540	0.91	Level	6%	0%	1.5	1.2	0.971	1.00	275		
M-4	SR-58 WB	Brundage Ln On	Right	1	25.0	249	480	480	0.90	Level	3%	0%	1.5	1.2	0.985	1.00	281		
M-5	SR-58 WB	Union Ave SB On	Right	1	25.0	344	540	540	0.90	Level	2%	0%	1.5	1.2	0.990	1.00	386		
M-6	SR-58 WB	H St On	Right	1	45.0	459	540	540	0.90	Level	2%	0%	1.5	1.2	0.990	1.00	515		
M-7	SR-99 NB	White Ln EB On	Right	1	25.0	1,155	360	360	0.86	Level	4%	0%	1.5	1.2	0.980	1.00	1,370		
M-8	SR-99 NB	White Ln WB On	Right	1	45.0	457	530	530	0.86	Level	1%	0%	1.5	1.2	0.995	1.00	534		
M-9	SR-99 NB	Ming Ave On	Right	1	45.0	1,215	560	560	0.88	Level	1%	0%	1.5	1.2	0.995	1.00	1,388		
M-10	SR-99 NB	Wible On	Right	1	25.0	561	550	550	0.90	Level	2%	0%	1.5	1.2	0.990	1.00	630		
M-11	SR-99 NB	SR-58 On	Right	1	55.0	1,084	560	560	0.88	Level	19%	0%	1.5	1.2	0.913	1.00	1,349		
M-12	SR-99 NB	California Ave EB On	Right	1	25.0	629	500	500	0.88	Level	1%	0%	1.5	1.2	0.995	1.00	718		
M-13	SR-99 NB	California Ave WB On	Right	1	45.0	297	540	540	0.86	Level	0%	0%	1.5	1.2	1.000	1.00	345		
M-14	SR-99 NB	Buck Owens Blvd On	Right	1	25.0	479	500	500	0.84	Level	10%	0%	1.5	1.2	0.952	1.00	599		
M-15	SR-99 SB	Airport Dr On	Right	1	45.0	1,725	500	500	0.86	Level	2%	0%	1.5	1.2	0.990	1.00	2,026		
M-16	SR-99 SB	Rosedale Hwy WB On	Right	1	25.0	1,267	540	540	0.88	Level	6%	0%	1.5	1.2	0.971	1.00	1,483		
M-17	SR-99 SB	Rosedale Hwy EB On	Right	1	45.0	1,191	630	630	0.88	Level	7%	0%	1.5	1.2	0.966	1.00	1,401		
M-18	SR-99 SB	California Ave On	Right	1	25.0	845	490	490	0.88	Level	1%	0%	1.5	1.2	0.995	1.00	965		
M-19	SR-99 SB	SR-58 On	Right	1	25.0	1,124	610	610	0.90	Level	3%	0%	1.5	1.2	0.985	1.00	1,268		
M-20	SR-99 SB	Real Rd On	Right	1	45.0	281	540	540	0.88	Level	1%	0%	1.5	1.2	0.995	1.00	321		
M-21	SR-99 SB	Ming Ave On	Right	1	45.0	458	550	550	0.88	Level	1%	0%	1.5	1.2	0.995	1.00	523		
M-22	SR-99 SB	White Ln WB On	Right	1	25.0	139	390	390	0.87	Level	1%	0%	1.5	1.2	0.995	1.00	161		
M-23	SR-99 SB	White Ln EB On	Right	1	45.0	138	520	520	0.86	Level	2%	0%	1.5	1.2	0.990	1.00	162		

HCM 2000
Merge Ramp Junctions
Capacity Analysis

General Information

Adjacent Upstream Ramp Data

Freeway/ Direction	On-ramp	Exists?	Distance	Volume (vph)	PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _p	Flow Rate v _p (pcph)
M-1	SR-58 EB Chester Ave On	No											
M-2	SR-58 EB Union Ave SB On	No											
M-3	SR-58 EB Union Ave NB On	No											
M-4	SR-58 WB Brundage Ln On	No											
M-5	SR-58 WB Union Ave SB On	No											
M-6	SR-58 WB H St On	No											
M-7	SR-99 NB White Ln EB On	Off	1,250	338	0.90	Level	4%	0%	1.5	1.2	0.980	1.00	383
M-8	SR-99 NB White Ln WB On	On	680	1,155	0.86	Level	4%	0%	1.5	1.2	0.980	1.00	1,370
M-9	SR-99 NB Ming Ave On	No											
M-10	SR-99 NB Wible On	No											
M-11	SR-99 NB SR-58 On	No											
M-12	SR-99 NB California Ave EB On	No											
M-13	SR-99 NB California Ave WB On	No											
M-14	SR-99 NB Buck Owens Blvd On	No											
M-15	SR-99 SB Airport Dr On	No											
M-16	SR-99 SB Rosedale Hwy WB On	No											
M-17	SR-99 SB Rosedale Hwy EB On	No											
M-18	SR-99 SB California Ave On	No											
M-19	SR-99 SB SR-58 On	No											
M-20	SR-99 SB Real Rd On	No											
M-21	SR-99 SB Ming Ave On	Off	2,870	1,557	0.90	Level	1%	0%	1.5	1.2	0.995	1.00	1,739
M-22	SR-99 SB White Ln WB On	Off	1,520	2,029	0.88	Level	3%	0%	1.5	1.2	0.985	1.00	2,340
M-23	SR-99 SB White Ln EB On	On	600	139	0.87	Level	1%	0%	1.5	1.2	0.995	1.00	161

HCM 2000
Merge Ramp Junctions
Capacity Analysis

General Information

Adjacent Downstream Ramp Data

v_{12} Estimation

Freeway/ Direction	On-ramp	Exists?	Volume				Truck/ Bus %		E_T	E_R	f_{HV}	f_p	Flow Rate v_p (pcph)	L_{EQ}		P_{FM} Equations			P_{FM}	v_{12} (pcph)
			Distance	(vph)	PHF	Terrain								25-2	25-3	1	2	3		
M-1	SR-58 EB Chester Ave On	No														0.593			1.000	3,476
M-2	SR-58 EB Union Ave SB On	No														0.591			1.000	3,523
M-3	SR-58 EB Union Ave NB On	No														0.593			1.000	3,764
M-4	SR-58 WB Brundage Ln On	No														0.591			1.000	3,070
M-5	SR-58 WB Union Ave SB On	No														0.593			1.000	3,337
M-6	SR-58 WB H St On	No														0.593			1.000	3,217
M-7	SR-99 NB White Ln EB On	On	680	457	0.86	Level	1%	0%	1.5	1.2	0.995	1.00	534	-95	3,606	0.588	0.751		0.588	1,502
M-8	SR-99 NB White Ln WB On	No												1,128		0.592			0.592	2,289
M-9	SR-99 NB Ming Ave On	No														0.593			0.183	696
M-10	SR-99 NB Wible On	No														0.593			0.384	1,357
M-11	SR-99 NB SR-58 On	No														0.593			0.163	675
M-12	SR-99 NB California Ave EB On	No														0.592			0.351	1,641
M-13	SR-99 NB California Ave WB On	No														0.593			0.308	1,658
M-14	SR-99 NB Buck Owens Blvd On	No														0.592			0.366	1,293
M-15	SR-99 SB Airport Dr On	No														0.592			0.088	340
M-16	SR-99 SB Rosedale Hwy WB On	No														0.593			0.273	1,396
M-17	SR-99 SB Rosedale Hwy EB On	No														0.595			0.199	1,313
M-18	SR-99 SB California Ave On	No														0.591			0.316	2,064
M-19	SR-99 SB SR-58 On	No														0.595			0.331	1,732
M-20	SR-99 SB Real Rd On	No														0.593			0.311	2,014
M-21	SR-99 SB Ming Ave On	No												1,394		0.593	0.831		0.593	3,010
M-22	SR-99 SB White Ln WB On	On	600	138	0.86	Level	2%	0%	1.5	1.2	0.990	1.00	162	-149	1,071	0.588	0.773		0.588	2,032
M-23	SR-99 SB White Ln EB On	No												988		0.592			0.592	2,132

HCM 2000
Merge Ramp Junctions
Capacity Analysis

General Information

Capacity Checks

Freeway/ Direction	On-ramp	V _{FI}			V _{FO}			V ₃ , V _{av34}			V _{12a}		
		(pcph)	Max v _{FI} (pcph)	LOS F?	(pcph)	Max v _{FO} (pcph)	LOS F?	(pcphpl)	> 2,700?	> 1.5*v ₁₂ /2?	(pcph)	VR12a (pcph)	Max v _{R12a} (pcph)
M-1	SR-58 EB Chester Ave On	3,476	4,700	No	4,107	4,700	No	0	No	No	3,476	4,107	4,600
M-2	SR-58 EB Union Ave SB On	3,523	4,700	No	3,769	4,700	No	0	No	No	3,523	3,769	4,600
M-3	SR-58 EB Union Ave NB On	3,764	4,700	No	4,039	4,700	No	0	No	No	3,764	4,039	4,600
M-4	SR-58 WB Brundage Ln On	3,070	4,700	No	3,351	4,700	No	0	No	No	3,070	3,351	4,600
M-5	SR-58 WB Union Ave SB On	3,337	4,700	No	3,723	4,700	No	0	No	No	3,337	3,723	4,600
M-6	SR-58 WB H St On	3,217	4,700	No	3,732	4,700	No	0	No	No	3,217	3,732	4,600
M-7	SR-99 NB White Ln EB On	2,555	7,050	No	3,925	7,050	No	1,054	No	No	1,502	2,871	4,600
M-8	SR-99 NB White Ln WB On	3,864	7,050	No	4,398	7,050	No	1,575	No	No	2,289	2,823	4,600
M-9	SR-99 NB Ming Ave On	3,801	9,400	No	5,188	9,400	No	1,552	No	Yes	1,520	2,908	4,600
M-10	SR-99 NB Wible On	3,530	9,400	No	4,159	9,400	No	1,087	No	Yes	1,412	2,042	4,600
M-11	SR-99 NB SR-58 On	4,150	9,400	No	5,499	9,400	No	1,737	No	Yes	1,660	3,009	4,600
M-12	SR-99 NB California Ave EB On	4,676	9,400	No	5,394	9,400	No	1,517	No	Yes	1,870	2,589	4,600
M-13	SR-99 NB California Ave WB On	5,374	9,400	No	5,720	9,400	No	1,858	No	Yes	2,150	2,495	4,600
M-14	SR-99 NB Buck Owens Blvd On	3,534	9,400	No	4,133	9,400	No	1,120	No	Yes	1,414	2,012	4,600
M-15	SR-99 SB Airport Dr On	3,840	9,400	No	5,866	9,400	No	1,750	No	Yes	1,536	3,562	4,600
M-16	SR-99 SB Rosedale Hwy WB On	5,110	9,400	No	6,593	9,400	No	1,857	No	Yes	2,044	3,527	4,600
M-17	SR-99 SB Rosedale Hwy EB On	6,605	9,400	No	8,005	9,400	No	2,646	No	Yes	2,642	4,043	4,600
M-18	SR-99 SB California Ave On	6,536	9,400	No	7,501	9,400	No	2,236	No	Yes	2,615	3,580	4,600
M-19	SR-99 SB SR-58 On	5,225	9,400	No	6,492	9,400	No	1,747	No	Yes	2,090	3,358	4,600
M-20	SR-99 SB Real Rd On	6,464	9,400	No	6,785	9,400	No	2,225	No	Yes	2,586	2,907	4,600
M-21	SR-99 SB Ming Ave On	5,077	7,050	No	5,600	7,050	No	2,067	No	No	3,010	3,533	4,600
M-22	SR-99 SB White Ln WB On	3,453	7,050	No	3,613	7,050	No	1,421	No	No	2,032	2,192	4,600
M-23	SR-99 SB White Ln EB On	3,601	7,050	No	3,763	7,050	No	1,469	No	No	2,132	2,294	4,600

**HCM 2000
Merge Ramp Junctions
Capacity Analysis**

General Information

Results

Speed Estimation

Freeway/ Direction	On-ramp	v_R (pcph)	Max v_R (pcph)	LOS F?	Density, D (pcplpm)	Level of Service	Int. Var. M_s	Inf. Area S_R (mph)	Out Lns. S_O (mph)	All vehs. S (mph)
M-1	SR-58 EB Chester Ave On	630	2,100	No	33.8	D	0.509	53.3	0.0	53.3
M-2	SR-58 EB Union Ave SB On	247	1,900	No	31.8	D	0.466	54.3	0.0	54.3
M-3	SR-58 EB Union Ave NB On	275	2,100	No	33.5	D	0.494	53.6	0.0	53.6
M-4	SR-58 WB Brundage Ln On	281	1,900	No	28.5	D	0.408	55.6	0.0	55.6
M-5	SR-58 WB Union Ave SB On	386	1,900	No	31.0	D	0.455	54.5	0.0	54.5
M-6	SR-58 WB H St On	515	2,100	No	31.0	D	0.435	55.0	0.0	55.0
M-7	SR-99 NB White Ln EB On	1,370	1,900	No	25.0	C	0.372	56.4	63.0	58.1
M-8	SR-99 NB White Ln WB On	534	2,100	No	23.9	C	0.339	57.2	61.1	58.6
M-9	SR-99 NB Ming Ave On	1,388	2,100	No	24.0	C	0.342	57.1	62.7	59.5
M-10	SR-99 NB Wible On	630	1,900	No	17.7	B	0.324	57.6	63.0	60.2
M-11	SR-99 NB SR-58 On	1,349	2,200	No	24.8	C	0.338	57.2	62.3	59.4
M-12	SR-99 NB California Ave EB On	718	1,900	No	22.2	C	0.348	57.0	61.8	59.4
M-13	SR-99 NB California Ave WB On	345	2,100	No	21.4	C	0.320	57.6	61.0	59.5
M-14	SR-99 NB Buck Owens Blvd On	599	1,900	No	17.8	B	0.325	57.5	63.0	60.2
M-15	SR-99 SB Airport Dr On	2,026	2,100	No	29.2	D	0.413	55.5	62.7	58.1
M-16	SR-99 SB Rosedale Hwy WB On	1,483	1,900	No	28.9	D	0.427	55.2	61.3	57.9
M-17	SR-99 SB Rosedale Hwy EB On	1,401	2,100	No	32.4	D	0.486	53.8	59.7	56.6
M-18	SR-99 SB California Ave On	965	1,900	No	29.9	D	0.436	55.0	59.7	57.4
M-19	SR-99 SB SR-58 On	1,268	1,900	No	27.3	C	0.403	55.7	61.2	58.2
M-20	SR-99 SB Real Rd On	321	2,100	No	24.6	C	0.344	57.1	59.8	58.6
M-21	SR-99 SB Ming Ave On	523	2,100	No	29.3	D	0.405	55.7	59.4	57.0
M-22	SR-99 SB White Ln WB On	161	1,900	No	20.1	C	0.336	57.3	61.7	58.9
M-23	SR-99 SB White Ln EB On	162	2,100	No	20.0	C	0.313	57.8	61.5	59.2

HCM 2000
Diverge Ramp Junctions
Capacity Analysis

Jurisdiction Bakersfield, CA Agency or Company TRIP
 Analysis Year Existing (2008) Date 3.3.10
 Analyst BP Project Description Centennial Corridor Study

General Information

Freeway Data

Freeway Volume Adjustment

Freeway/ Direction	Off-ramp	Analysis Time Period	Lanes	S _{FF} (mph)	V (vph)	PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	Flow Rate v _p (pcph)
D-2	SR-58 EB Union Ave Off	PM	2	65.0	3,562	0.92	Level	11%	0.0%	1.5	1.2	0.948	1.00	4,085
D-3	SR-58 WB Brundage Ln Off	PM	2	65.0	3,053	0.92	Level	9%	0.0%	1.5	1.2	0.957	1.00	3,468
D-4	SR-58 WB Chester Ave Off	PM	2	65.0	3,296	0.92	Level	8%	0.0%	1.5	1.2	0.962	1.00	3,726
D-5	SR-58 WB SR-99 NB Off	PM	2	65.0	3,291	0.92	Level	8%	0.0%	1.5	1.2	0.962	1.00	3,720
D-6	SR-58 WB SR-99 SB Off	PM	2	65.0	2,207	0.92	Level	2%	0.0%	1.5	1.2	0.990	1.00	2,423
D-7	SR-99 NB White Ln Off	PM	3	65.0	2,448	0.90	Level	16%	0.0%	1.5	1.2	0.926	1.00	2,938
D-8	SR-99 NB Ming Ave Off	PM	4	65.0	3,722	0.94	Level	12%	0.0%	1.5	1.2	0.943	1.00	4,197
D-9	SR-99 NB SR-58 Off	PM	4	65.0	4,534	0.93	Level	10%	0.0%	1.5	1.2	0.952	1.00	5,119
D-10	SR-99 NB California Ave Off	PM	4	65.0	4,742	0.93	Level	13%	0.0%	1.5	1.2	0.939	1.00	5,430
D-11	SR-99 NB Rosedale Hwy Off	PM	4	65.0	4,990	0.92	Level	12%	0.0%	1.5	1.2	0.943	1.00	5,749
D-12	SR-99 NB Buck Owens Blvd Off	PM	4	65.0	3,230	0.92	Level	15%	0.0%	1.5	1.2	0.930	1.00	3,774
D-13	SR-99 NB Airport Dr Off	PM	4	65.0	3,405	0.89	Level	15%	0.0%	1.5	1.2	0.930	1.00	4,113
D-14	SR-99 SB Rosedale Hwy Off	PM	4	65.0	4,875	0.88	Level	12%	0.0%	1.5	1.2	0.943	1.00	5,872
D-15	SR-99 SB California Ave Off	PM	4	65.0	6,700	0.92	Level	10%	0.0%	1.5	1.2	0.952	1.00	7,647
D-16	SR-99 SB SR-58 Off	PM	4	65.0	6,518	0.92	Level	10%	0.0%	1.5	1.2	0.952	1.00	7,439
D-17	SR-99 SB Ming Ave Off	PM	4	65.0	6,027	0.92	Level	7%	0.0%	1.5	1.2	0.966	1.00	6,780
D-18	SR-99 SB White Ln Off	PM	3	65.0	4,928	0.89	Level	8%	0.0%	1.5	1.2	0.962	1.00	5,759

HCM 2000
Diverge Ramp Junctions
Capacity Analysis

General Information

Off-Ramp Data

Off-Ramp Volume Adjustment

Freeway/ Direction			Off-ramp		Type	S _{FR} (mph)	V _R (vph)	Decel Lane (ft)			Truck/ Bus %										Flow Rate
					Lanes			L _{D1}	L _{D2}	L _{Def}	PHF	Terrain	RV %	E _T	E _R	f _{HV}	f _P	v _p (pcph)			
D-2	SR-58 EB	Union Ave Off	Right	1	45.0	557	140			140	0.90	Level	12%	0.0%	1.5	1.2	0.943	1.00	656		
D-3	SR-58 WB	Brundage Ln Off	Right	1	25.0	350	150			150	0.88	Level	5%	0.0%	1.5	1.2	0.976	1.00	408		
D-4	SR-58 WB	Chester Ave Off	Right	1	45.0	464	140			140	0.90	Level	2%	0.0%	1.5	1.2	0.990	1.00	521		
D-5	SR-58 WB	SR-99 NB Off	Right	1	55.0	1,084	160			160	0.90	Level	19%	0.0%	1.5	1.2	0.913	1.00	1,319		
D-6	SR-58 WB	SR-99 SB Off	Right	1	25.0	1,124	110			110	0.88	Level	3%	0.0%	1.5	1.2	0.985	1.00	1,296		
D-7	SR-99 NB	White Ln Off	Right	1	45.0	338	140			140	0.90	Level	4%	0.0%	1.5	1.2	0.980	1.00	383		
D-8	SR-99 NB	Ming Ave Off	Right	1	25.0	403	200			200	0.90	Level	1%	0.0%	1.5	1.2	0.995	1.00	450		
D-9	SR-99 NB	SR-58 Off	Right	1	55.0	1,437	140			140	0.92	Level	5%	0.0%	1.5	1.2	0.976	1.00	1,601		
D-10	SR-99 NB	California Ave Off	Right	1	45.0	678	140			140	0.90	Level	1%	0.0%	1.5	1.2	0.995	1.00	757		
D-11	SR-99 NB	Rosedale Hwy Off	Right	1	45.0	1,760	140			140	0.90	Level	6%	0.0%	1.5	1.2	0.971	1.00	2,014		
D-12	SR-99 NB	Buck Owens Blvd Off	Right	1	25.0	304	140			140	0.88	Level	11%	0.0%	1.5	1.2	0.948	1.00	364		
D-13	SR-99 NB	Airport Dr Off	Right	1	45.0	1,211	300			300	0.88	Level	4%	0.0%	1.5	1.2	0.980	1.00	1,404		
D-14	SR-99 SB	Rosedale Hwy Off	Right	1	45.0	633	140			140	0.92	Level	9%	0.0%	1.5	1.2	0.957	1.00	719		
D-15	SR-99 SB	California Ave Off	Right	1	45.0	1,027	140			140	0.92	Level	1%	0.0%	1.5	1.2	0.995	1.00	1,122		
D-16	SR-99 SB	SR-58 Off	Right	1	55.0	1,896	160			160	0.92	Level	16%	0.0%	1.5	1.2	0.926	1.00	2,226		
D-17	SR-99 SB	Ming Ave Off	Right	1	45.0	1,557	210			210	0.90	Level	1%	0.0%	1.5	1.2	0.995	1.00	1,739		
D-18	SR-99 SB	White Ln Off	Right	2	45.0	2,029	140	1,150	1,430	0.88	Level	3%	0.0%	1.5	1.2	0.985	1.00	2,340			

HCM 2000
Diverge Ramp Junctions
Capacity Analysis

General Information

Adjacent Upstream Ramp Data

Freeway/ Direction			Off-ramp		Exists?	Distance	Volume (vph)	PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _P	Flow Rate v _P (pcph)
D-2	SR-58 EB	Union Ave Off			No											
D-3	SR-58 WB	Brundage Ln Off			No											
D-4	SR-58 WB	Chester Ave Off			No											
D-5	SR-58 WB	SR-99 NB Off			No											
D-6	SR-58 WB	SR-99 SB Off			No											
D-7	SR-99 NB	White Ln Off			No											
D-8	SR-99 NB	Ming Ave Off			No											
D-9	SR-99 NB	SR-58 Off			No											
D-10	SR-99 NB	California Ave Off			No											
D-11	SR-99 NB	Rosedale Hwy Off			No											
D-12	SR-99 NB	Buck Owens Blvd Off			No											
D-13	SR-99 NB	Airport Dr Off			No											
D-14	SR-99 SB	Rosedale Hwy Off			No											
D-15	SR-99 SB	California Ave Off			No											
D-16	SR-99 SB	SR-58 Off			No											
D-17	SR-99 SB	Ming Ave Off			No											
D-18	SR-99 SB	White Ln Off			On	5,270	458	0.95	Level	1%	0.0%	1.5	1.2	0.995	1.00	485

HCM 2000
Diverge Ramp Junctions
Capacity Analysis

General Information			Adjacent Downstream Ramp Data											v ₁₂ Estimation			
Freeway/ Direction	Off-ramp	Exists?	Distance	Volume (vph)	PHF	Terrain	Truck/ Bus %	RV %	E _T	E _R	f _{HV}	f _p	Flow Rate v _p (pcph)	L _{EQ}		P _{FD}	v ₁₂ (pcph)
D-2	SR-58 EB Union Ave Off	No														1.000	4,085
D-3	SR-58 WB Brundage Ln Off	No														1.000	3,468
D-4	SR-58 WB Chester Ave Off	No														1.000	3,726
D-5	SR-58 WB SR-99 NB Off	No														1.000	3,720
D-6	SR-58 WB SR-99 SB Off	No														1.000	2,423
D-7	SR-99 NB White Ln Off	On	1,250	1,155	0.86	Level	4.0%	0.0%	1.5	1.2	0.980	1.00	1,370	1,498	0.669	2,092	
D-8	SR-99 NB Ming Ave Off	No														0.436	2,084
D-9	SR-99 NB SR-58 Off	No														0.436	3,135
D-10	SR-99 NB California Ave Off	No														0.436	2,795
D-11	SR-99 NB Rosedale Hwy Off	No														0.436	3,643
D-12	SR-99 NB Buck Owens Blvd Off	No														0.436	1,851
D-13	SR-99 NB Airport Dr Off	No														0.436	2,585
D-14	SR-99 SB Rosedale Hwy Off	No														0.436	2,966
D-15	SR-99 SB California Ave Off	No														0.436	3,967
D-16	SR-99 SB SR-58 Off	No														0.436	4,499
D-17	SR-99 SB Ming Ave Off	No														0.436	3,937
D-18	SR-99 SB White Ln Off	On	1,520	139	0.87	Level	1.0%	0.0%	1.5	1.2	0.995	1.00	161	18,936	1,572	0.450	3,878

HCM 2000
Diverge Ramp Junctions
Capacity Analysis

General Information

Capacity Checks

Freeway/ Direction			Off-ramp			V _{F1} (pcph)	Max V _{F1} (pcph)	LOS F?	V ₃ , V _{av34} (pcphpl)	V ₃ , V _{av34} > 2,700?	V ₃ , V _{av34} > 1.5*V ₁₂ /2?	V _{12a} (pcph)	Max V ₁₂ (pcph)	LOS F?	V _{FO} (pcph)	Max V _{FO} (pcph)	LOS F?
D-2	SR-58 EB	Union Ave Off				4,085	4,700	No	0	No	No	4,085	4,400	No	3,429	4,700	No
D-3	SR-58 WB	Brundage Ln Off				3,468	4,700	No	0	No	No	3,468	4,400	No	3,060	4,700	No
D-4	SR-58 WB	Chester Ave Off				3,726	4,700	No	0	No	No	3,726	4,400	No	3,205	4,700	No
D-5	SR-58 WB	SR-99 NB Off				3,720	4,700	No	0	No	No	3,720	4,400	No	2,401	4,700	No
D-6	SR-58 WB	SR-99 SB Off				2,423	4,700	No	0	No	No	2,423	4,400	No	1,126	4,700	No
D-7	SR-99 NB	White Ln Off				2,938	7,050	No	846	No	No	2,092	4,400	No	2,555	7,050	No
D-8	SR-99 NB	Ming Ave Off				4,197	9,400	No	1,057	No	No	2,084	4,400	No	3,747	9,400	No
D-9	SR-99 NB	SR-58 Off				5,119	9,400	No	992	No	No	3,135	4,400	No	3,518	9,400	No
D-10	SR-99 NB	California Ave Off				5,430	9,400	No	1,318	No	No	2,795	4,400	No	4,673	9,400	No
D-11	SR-99 NB	Rosedale Hwy Off				5,749	9,400	No	1,053	No	No	3,643	4,400	No	3,735	9,400	No
D-12	SR-99 NB	Buck Owens Blvd Off				3,774	9,400	No	962	No	No	1,851	4,400	No	3,410	9,400	No
D-13	SR-99 NB	Airport Dr Off				4,113	9,400	No	764	No	No	2,585	4,400	No	2,709	9,400	No
D-14	SR-99 SB	Rosedale Hwy Off				5,872	9,400	No	1,453	No	No	2,966	4,400	No	5,153	9,400	No
D-15	SR-99 SB	California Ave Off				7,647	9,400	No	1,840	No	No	3,967	4,400	No	6,525	9,400	No
D-16	SR-99 SB	SR-58 Off				7,439	9,400	No	1,470	No	No	4,499	4,400	Yes	5,213	9,400	No
D-17	SR-99 SB	Ming Ave Off				6,780	9,400	No	1,422	No	No	3,937	4,400	No	5,042	9,400	No
D-18	SR-99 SB	White Ln Off				5,759	7,050	No	1,880	No	No	3,878	4,400	No	3,418	7,050	No

**HCM 2000
Diverge Ramp Junctions
Capacity Analysis**

General Information

Results

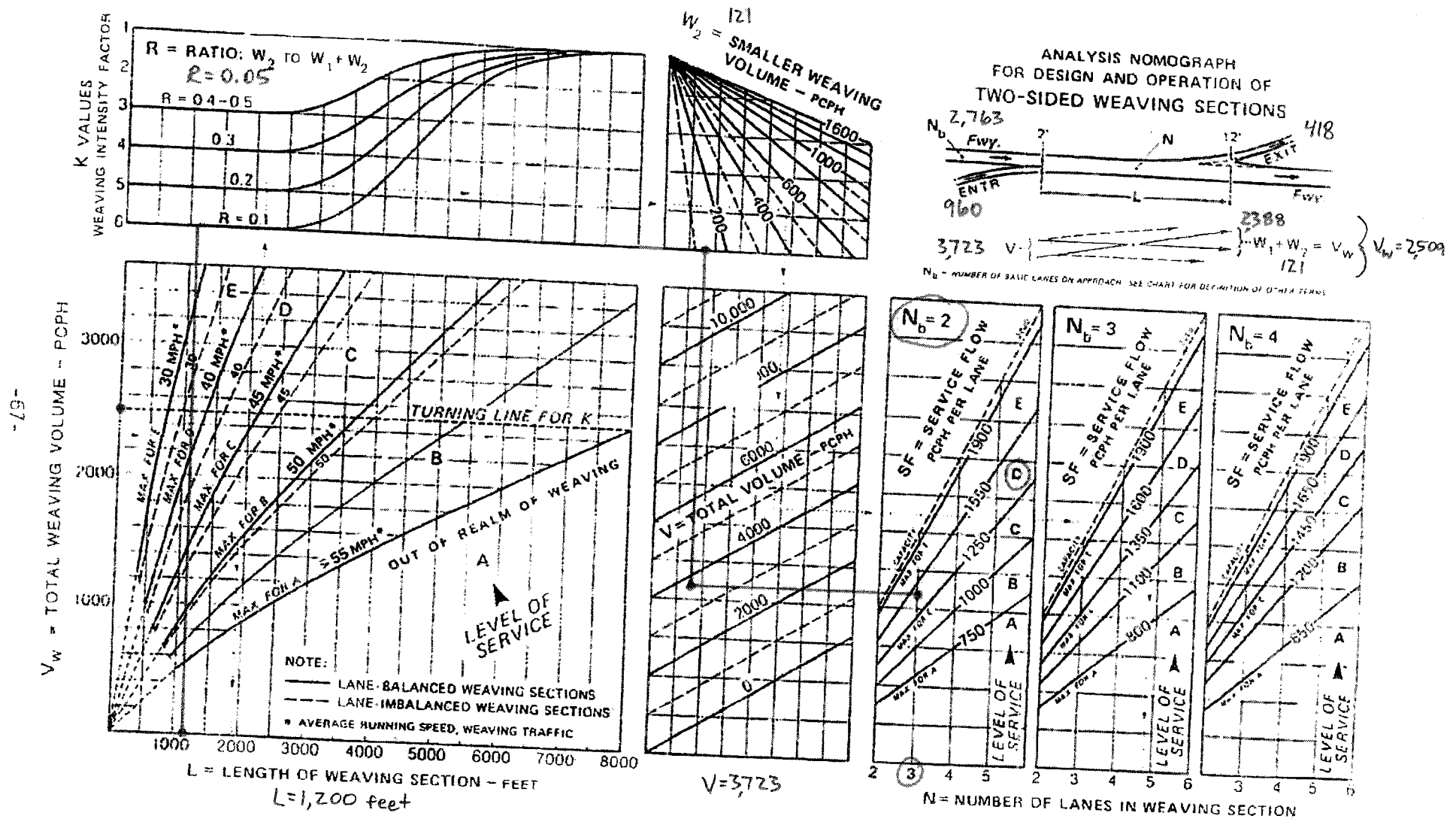
Speed Estimation

Freeway/ Direction			v_R (pcph)	Max v_R (pcph)	LOS F?	Density, D (pcplpm)	Level of Service	Int. Var. D_s	Inf. Area S_R (mph)	Out Lns. S_o (mph)	All vehs. S (mph)
Off-ramp											
D-2	SR-58 EB	Union Ave Off	656	2,100	No	38.1	E	0.357	56.8	0.0	56.8
D-3	SR-58 WB	Brundage Ln Off	408	1,900	No	32.7	D	0.595	51.3	0.0	51.3
D-4	SR-58 WB	Chester Ave Off	521	2,100	No	35.0	E	0.345	57.1	0.0	57.1
D-5	SR-58 WB	SR-99 NB Off	1,319	2,200	No	34.8	D	0.287	58.4	0.0	58.4
D-6	SR-58 WB	SR-99 SB Off	1,296	1,900	No	24.1	C	0.675	49.5	0.0	49.5
D-7	SR-99 NB	White Ln Off	383	2,100	No	21.0	C	0.332	57.4	71.3	60.8
D-8	SR-99 NB	Ming Ave Off	450	1,900	No	20.4	C	0.599	51.2	71.1	59.6
D-9	SR-99 NB	SR-58 Off	1,601	2,200	No	30.0	D	0.312	57.8	71.3	62.4
D-10	SR-99 NB	California Ave Off	757	2,100	No	27.0	C	0.366	56.6	70.1	62.4
D-11	SR-99 NB	Rosedale Hwy Off	2,014	2,100	No	34.3	D	0.479	54.0	71.1	59.2
D-12	SR-99 NB	Buck Owens Blvd Off	364	1,900	No	18.9	B	0.591	51.4	71.3	59.9
D-13	SR-99 NB	Airport Dr Off	1,404	2,100	No	23.8	C	0.424	55.2	71.3	60.3
D-14	SR-99 SB	Rosedale Hwy Off	719	2,100	No	28.5	D	0.363	56.7	69.5	62.4
D-15	SR-99 SB	California Ave Off	1,122	2,100	No	37.1	E	0.399	55.8	68.0	61.1
D-16	SR-99 SB	SR-58 Off	2,226	2,200	Yes	-	F	0.368	56.5	69.5	61.0
D-17	SR-99 SB	Ming Ave Off	1,739	2,100	No	36.2	E	0.454	54.5	69.7	60.0
D-18	SR-99 SB	White Ln Off	2,340	4,100	No	24.7	C	0.509	53.3	67.9	57.3

ATTACHMENT 2 – LEISCH METHOD CALCULATIONS

CENTENNIAL CORRIDOR
EXISTING AM PEAK HOUR

EASTBOUND SR 58
SR 99 TO H STREET

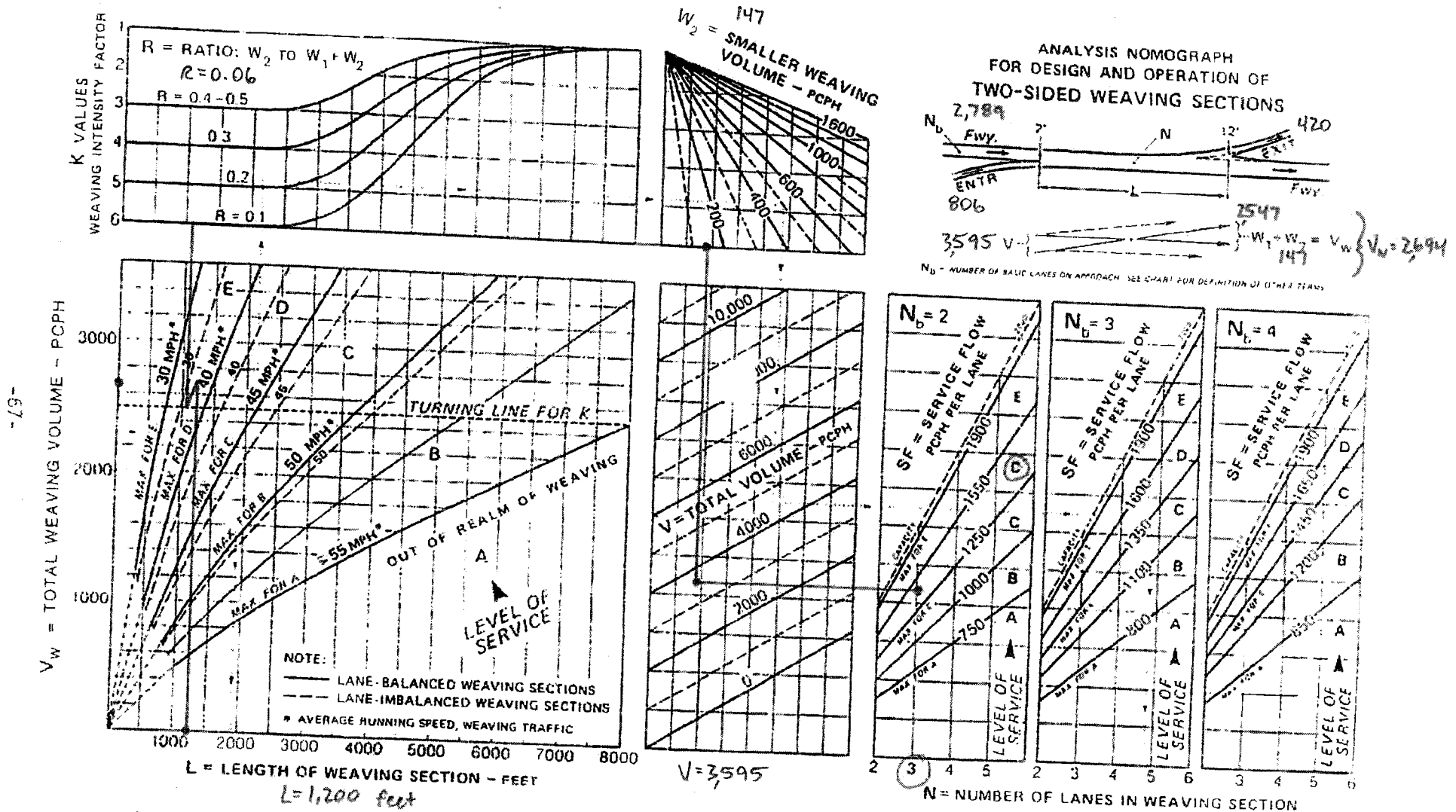


NOMOGRAPH FOR DESIGN AND ANALYSIS OF WEAVING SECTIONS-TWO-SIDED CONFIGURATIONS

NOMOGRAPH 2

CENTENNIAL CORRIDOR
EXISTING PM PEAK HOUR

EASTBOUND SR 58
SR 99 TO H STREET



NOMOGRAPH FOR DESIGN AND ANALYSIS OF WEAVING SECTIONS—TWO-SIDED CONFIGURATIONS

NOMOGRAPH 2

ATTACHMENT 3 – HCS+ SAMPLE RESULTS

HCS+: Basic Freeway Segments Release 5.3

Phone:
E-mail:

Fax:

Operational Analysis

Analyst: BP
 Agency or Company: Fehr & Peers
 Date Performed: 4/21/2010
 Analysis Time Period: AM Peak Hour
 Freeway/Direction: SR-58 Eastbound
 From/To: Chester Avenue to Union Avenue
 Jurisdiction: Bakersfield
 Analysis Year: Existing
 Description: Centennial Corridor Study

Flow Inputs and Adjustments

Volume, V	3618	veh/h
Peak-hour factor, PHF	0.92	
Peak 15-min volume, v15	983	v
Trucks and buses	10	%
Recreational vehicles	0	%
Terrain type:	Level	
Grade	0.00	%
Segment length	0.00	mi
Trucks and buses PCE, ET	1.5	
Recreational vehicle PCE, ER	1.2	
Heavy vehicle adjustment, fHV	0.952	
Driver population factor, fp	1.00	
Flow rate, vp	2065	pc/h/ln

Speed Inputs and Adjustments

Lane width	12.0	ft
Right-shoulder lateral clearance	6.0	ft
Interchange density	0.50	interchange/mi
Number of lanes, N	2	
Free-flow speed:	Measured	
FFS or BFFS	65.0	mi/h
Lane width adjustment, fLW	0.0	mi/h
Lateral clearance adjustment, fLC	0.0	mi/h
Interchange density adjustment, fID	0.0	mi/h
Number of lanes adjustment, fN	4.5	mi/h
Free-flow speed, FFS	65.0	mi/h
	Urban Freeway	

LOS and Performance Measures

Flow rate, vp	2065	pc/h/ln
Free-flow speed, FFS	65.0	mi/h
Average passenger-car speed, S	60.3	mi/h
Number of lanes, N	2	
Density, D	34.3	pc/mi/ln

Level of service, LOS

D

Overall results are not computed when free-flow speed is less than 55 mph.

HCS+: Ramps and Ramp Junctions Release 5.3

Phone: . Fax:
E-mail:

Merge Analysis

Analyst: BP
Agency/Co.: Fehr & Peers
Date performed: 4/21/2010
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR-58 Westbound
Junction: H Street
Jurisdiction: Bakersfield
Analysis Year: Existing
Description: Centennial Corridor Study

Freeway Data

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	2622	vph

On Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	45.0	mph
Volume on ramp	333	vph
Length of first accel/decel lane	540	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	2622	333	vph
Peak-hour factor, PHF	0.88	0.90	
Peak 15-min volume, v15	745	93	v
Trucks and buses	15	4	%
Recreational vehicles	0	0	%
Terrain type:	Level	Level	
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5*	1.5	
Recreational vehicle PCE, ER	1.2	1.2	

Heavy vehicle adjustment, fHV	0.930	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3203	377	pcph

Estimation of V12 Merge Areas

$L =$ (Equation 25-2 or 25-3)
 EQ
 $P = 1.000$ Using Equation 0
 FM
 $v_{12} = v_F(P_{FM}) = 3203 \text{ pc/h}$

Capacity Checks

		Actual	Maximum	LOS F?
v_{FO}		3580	4700	No
$v_{3 \text{ or } av34}$	v	0 pc/h	(Equation 25-4 or 25-5)	
Is $v_{3 \text{ or } av34} > 2700 \text{ pc/h?}$	v		No	
Is $v_{3 \text{ or } av34} > 1.5 v_{12} / 2$	v		No	
If yes, $v_{12A} = 3203$			(Equation 25-8)	

Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
v_{R12}	3203	4600	No

Level of Service Determination (if not F)

Density, $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 29.8 \text{ pc/mi/ln}$
 Level of service for ramp-freeway junction areas of influence D

Speed Estimation

Intermediate speed variable,	$M = 0.412$	
Space mean speed in ramp influence area,	$S_R = 55.5$	mph
Space mean speed in outer lanes,	$S_O = N/A$	mph
Space mean speed for all vehicles,	$S = 55.5$	mph

Phone: Fax:
E-mail:

Diverge Analysis

Analyst: BP
Agency/Co.: Fehr & Peers
Date performed: 4/21/2010
Analysis time period: AM Peak Hour
Freeway/Dir of Travel: SR-58 Eastbound
Junction: Union Avenue
Jurisdiction: Bakersfield
Analysis Year: Existing
Description: Centennial Corridor Study

Freeway Data

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	65.0	mph
Volume on freeway	3618	vph

Off Ramp Data

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	45.0	mph
Volume on ramp	821	vph
Length of first accel/decel lane	140	ft
Length of second accel/decel lane		ft

Adjacent Ramp Data (if one exists)

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

Conversion to pc/h Under Base Conditions

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3618	821		vph
Peak-hour factor, PHF	0.92	0.90		
Peak 15-min volume, v15	983	228		v
Trucks and buses	10	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.952	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	4129	930	pcph

Estimation of V12 Diverge Areas

$L =$ (Equation 25-8 or 25-9)
 EQ
 $P = 1.000$ Using Equation 0
 FD
 $v_{12} = v_R + (v_F - v_R) P_{FD} = 4129$ pc/h

Capacity Checks

$v_{Fi} = v_F$	Actual	Maximum	LOS F?
	4129	4700	No
$v_{FO} = v_F - v_R$	3199	4700	No
v_R	930	2100	No
$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } av34} > 2700$ pc/h?		No	
Is $v_{3 \text{ or } av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 4129$		(Equation 25-18)	

Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
v_{12}	4129	4400	No

Level of Service Determination (if not F)

Density, $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 38.5$ pc/mi/ln
 Level of service for ramp-freeway junction areas of influence E

Speed Estimation

Intermediate speed variable,	$D_S = 0.382$	
Space mean speed in ramp influence area,	$S_R = 56.2$	mph
Space mean speed in outer lanes,	$S_0 = N/A$	mph
Space mean speed for all vehicles,	$S = 56.2$	mph



TECHNICAL MEMORANDUM

Date: December 3, 2010

To: Steve McDonald and Koko Widyatmoko, Caltrans
Steve Crouch, TRIP Corridor Manager
Curt Hatton, Caltrans Project Manager
Ravi Puttagunta, TRIP PMC (Parsons)
Jim Billings and Traci Gleason, HNTB

From: Rob Hananouchi, Bill Penney, and Fred Choa, Fehr & Peers

**Subject: Centennial Corridor – Existing AM and PM Peak Hour Analysis Results
for 54 Study Intersections
Updated Based on TRIP/Caltrans Comments**

RS08-2569

The purpose of this technical memorandum is to present the Existing AM and PM peak hour analysis results for the 54 study intersections included in the Centennial Corridor Project Traffic Operations Report. Based on comments received on the April 14, 2010 submittal, we have made appropriate updates to the existing intersections. This submittal includes the following data:

- 1) Responses to the comments received on the April 14, 2010 submittal
- 2) Existing AM peak hour Synchro output – timings and HCS analysis
- 3) Existing PM peak hour Synchro output – timings and HCS analysis

Level of Service Analysis Methodology

The operations of roadway facilities are described with the term level of service (LOS). LOS is a qualitative description of traffic flow based on such factors as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS A, with the least congested operating conditions, to LOS F, with the most congested operating conditions. LOS E represents “at-capacity” operations. Operations are designated as LOS F when volumes exceed capacity, resulting in stop-and-go conditions.

The level of service method for signalized intersections analyzes intersection operations based on average control vehicular delay, as described in Chapter 16 of the *2000 Highway Capacity Manual (HCM)* by the Transportation Research Board. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The average control delay for signalized intersections is calculated using the Synchro 6 analysis software and is correlated to LOS designations.

According to the Metropolitan Bakersfield General Plan, the City of Bakersfield strives to maintain a LOS C at its facilities. Caltrans District 6 aims to maintain a level of service at the LOS C/D cusp threshold (i.e., LOS C) for State facilities.

Existing Intersection AM and PM Peak Hour Operations Analysis

The following sections discuss the Synchro model development process used to determine existing intersection operations.

Synchro Model Development

An AM and PM peak hour Synchro model was developed for the study intersections. The Synchro models were coded with the peak hour volumes, posted speed limit, and signal timings. Traffic signal-related information such as phasing and initial timings (minimum greens, maximum green, gap, etc.) for signalized intersections was obtained from the respective agencies and municipalities. Additional detail such as lane geometries and turn pocket lengths was coded based on field observation.

Model Parameter Adjustments

Default peak hour factor, right-turn on red reductions, and truck percentages were adjusted to reflect field observations.

Peak Hour Factor Assumptions

For the existing conditions analysis, peak hour factors (PHF) were coded into Synchro for each intersection approach as requested by Caltrans / TRIP at our traffic meeting held at Caltrans District 6 offices in Fresno. The PHF for each intersection approach were calculated from the intersection count sheets.

Right-Turn on Red Assumptions

The Synchro software calculates right-turn on red reductions (RTOR) based on the HCM gap acceptance formula for right-turns. To reflect discussions with Caltrans / TRIP, the following manual adjustments to RTOR were coded into Synchro:

- For shared right-turn lanes, the RTOR was manually adjusted to 0%.
- For right-turns with a total right-turning volume less than or equal to 100 vehicles, the RTOR was unadjusted.
- For right-turns with a volume greater than 100 vehicles and a Synchro calculated RTOR greater than 30%, the RTOR was manually adjusted to 30%.
- For right-turns with a volume greater than 100 vehicles and a Synchro calculated RTOR less than 30%, the RTOR was unadjusted.

These manual adjustments were based on field observations and the resulting Synchro delay results compared by the project team for reasonableness and consistency to field observations.

Intersection Analysis Results

The results of the intersection LOS calculations for Existing Conditions are presented in Table 1 for AM Peak Hour Conditions and Table 2 for PM Peak Hour Conditions. Attachment 2 contains the corresponding calculation sheets from Synchro 6 as well as delay and LOS by approach.

Should you have any questions, please feel free to contact either Fred Choa or Bill Penney.

Table 1 - Existing AM Conditions (Updated 12.3.10)									
Intersection Level of Service Analysis									

	East-West Street	North-South Street	Control	Signal Cycle Length (sec) ¹	EB Approach		WB Approach		NB Approach		SB Approach		Intersection	
					Delay ²	LOS ³	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 99 SB Ramps	Airport Drive / State Road	Signalized	U - 133.8 (111.8)	46.3	D	41.9	D	24.9	C	39.0	D	35.9	D
2	SR 99 NB Ramps	Airport Drive / Buck Owens Boulevard	Signalized	U - 85.3 (61.4)			22.1	C	5.9	A			8.8	A
3	Rio Mirada Drive	Buck Owens Boulevard	Signalized	U - 92.1 (56.7)	64.0	E	10.3	B	18.6	B	21.6	C	43.7	D
4	SR 99 NB Ramps	Buck Owens Boulevard / Sillect Avenue	Signalized	U - 152.7 (99.6)	43.1	D	44.3	D	33.3	C	37.0	D	38.9	D
5	Rosedale Highway	Allen Road	Signalized	U - 137.4 (107.3)	36.3	D	31.7	C	42.4	D	40.3	D	37.3	D
6	Rosedale Highway	Calloway Drive	Signalized	C - 140.0	84.9	F	45.5	D	69.7	E	67.0	E	69.0	E
7	Rosedale Highway	Coffee Road	Signalized	C - 140.0	119.2	F	33.8	C	72.6	E	52.5	D	75.7	E
8	Rosedale Highway	Mohawk Street	Unsignalized		0.0	A	52.9	F	62.4	F			62.4	F
9	Rosedale Highway	Camino del Rio Court	Signalized	C - 140.0	23.6	C	18.8	B	185.2	F	62.8	E	28.6	C
10	Rosedale Highway	SR 99 SB Ramps	Signalized	C - 140.0	3.3	A	1.9	A			356.3	F	41.0	D
11	Rosedale Highway	SR 99 NB Ramps	Signalized	C - 140.0	30.9	C	68.3	E	52.0	D	46.0	D	50.9	D
12	24th Street	Oak Street	Signalized	C - 159.4	110.4	F	74.9	E	59.9	E	87.8	F	89.4	F
19	Brimhall Road	Allen Road	Signalized	U - 115.0 (65.3)	21.4	C	19.1	B	18.8	B	23.8	C	21.2	C
22	Stockdale Highway	Allen Road	Signalized	U - 137.0 (109.8)	41.0	D	33.8	C	42.9	D	40.4	D	39.0	D
23	Brimhall Road	Calloway Drive	Signalized	U - 135.0 (95.9)	34.0	C	30.1	C	31.4	C	31.4	C	31.9	C
26	Stockdale Highway	Calloway Drive / Old River Road	Signalized	C - 108.0	29.9	C	29.1	C	43.1	D	41.6	D	36.1	D
27	Brimhall Road	Coffee Road	Signalized	U - 112.7 (94.3)	32.6	C	42.8	D	33.3	C	111.7	F	60.1	E
29	Truxtun Avenue	Coffee Road	Signalized	C - 108.0			39.4	D	74.0	E	70.8	E	67.2	E
30	Stockdale Highway	Coffee Road	Signalized	C - 108.0	115.4	F	160.9	F	103.3	F	78.6	E	112.0	F
35	Truxtun Avenue	Mohawk Street	Signalized	C - 108.0	24.2	C	28.7	C	46.0	D			29.0	C
36	California Avenue	Mohawk Street	Signalized	C - 108.0	41.4	D	57.8	E	23.4	C	34.5	C	30.5	C
37	Stockdale Highway	California Avenue	Signalized	C - 108.0	44.1	D	81.5	F	54.1	D	45.7	D	55.9	E
38	Truxtun Avenue	Oak Street	Signalized	C - 108.0	58.0	E	49.4	D	31.3	C	30.4	C	43.3	D
39	California Avenue	Chester Lane	Signalized	C - 108.0	10.6	B	15.7	B	57.6	E	45.3	D	17.5	B
40	SR 99 SB Ramps	California Avenue / Real Road	Signalized	C - 108.0	26.3	C	17.5	B	103.6	F	89.2	F	49.2	D
41	SR 99 NB Ramps	California Avenue	Signalized	C - 108.0	14.7	B	145.8	F	90.7	F	101.6	F	74.8	E
42	California Avenue	Oak Street	Signalized	C - 108.0	51.4	D	31.4	C	49.2	D	31.8	C	44.1	D
46	California Avenue	Union Avenue	Signalized	U - 112.7 (102.6)	36.8	D	40.5	D	77.8	E	30.5	C	50.0	D
47	Stockdale Highway	Real Road	Signalized	C - 108.0	93.0	F	35.4	D	165.3	F	111.9	F	95.8	F
48	SR 99 SB Ramps	Stockdale Highway	Signalized	C - 108.0	0.5	A	6.9	A			46.9	D	12.2	B
49	Stockdale Highway / Brundage Lane	Oak Street / Wible Road	Signalized	C - 108.0	5.0	A	37.2	D	39.1	D	52.4	D	28.9	C
50	SR 58 EB/WB Ramps	Real Road	Signalized	U - 159.4 (104.0)			19.5	B	38.5	D	27.3	C	27.0	C
51	SR 99 NB Ramps	Wible Road	Signalized	U - 107.8 (70.9)	23.1	C			14.7	B	20.3	C	17.9	B
52	Brundage Lane	H Street	Signalized	C - 82.0	37.0	D	27.5	C	11.0	B	21.3	C	20.7	C
53	SR 58 WB Ramps	H Street	Signalized	C - 82.0			23.8	C	1.4	A	50.7	D	17.1	B
54	SR 58 EB Ramps	H Street	Signalized	C - 82.0	41.6	D			54.0	D	6.1	A	41.1	D
55	Brundage Lane	Chester Avenue	Signalized	C - 82.0	18.4	B	37.9	D	17.2	B	18.8	B	21.0	C
56	SR 58 WB Ramps	Chester Avenue	Signalized	C - 82.0			42.1	D	2.3	A	16.7	B	18.0	B
57	SR 58 EB Ramps	Chester Avenue	Signalized	C - 82.0	50.7	D			28.2	C	7.1	A	28.9	C
58	Brundage Lane	Union Avenue	Signalized	U - 112.2 (89.9)	40.6	D	35.9	D	54.2	D	26.9	C	42.1	D
59	SR 58 WB Ramps	Union Avenue / Brundage Lane	Signalized	U - 103.3 (65.6)	19.0	B	20.0	C	18.2	B	29.8	C	19.7	B
60	SR 58 EB Ramps	Union Avenue	Signalized	U - 59.1 (55.5)	25.4	C			13.6	B	11.9	B	16.2	B
61	Ming Avenue	New Stine Road	Signalized	C - 108.0	76.9	E	40.9	D	46.9	D	36.1	D	56.5	E
62	Ming Avenue	Real Road	Signalized	C - 108.0	23.0	C	16.4	B	45.9	D	51.8	D	25.4	C
63	SR 99 SB Ramps	Ming Avenue	Signalized ⁴	C - 108.0	1.9	A	6.6	A	1.4	A	5.1	A	3.4	A
64	Ming Avenue	Wible Road	Signalized	C - 108.0	85.6	F	14.0	B	46.7	D	45.3	D	61.3	E
65	SR 99 NB Ramps	Ming Avenue	Signalized	C - 108.0	10.9	B	45.8	D	50.6	D	74.8	E	26.7	C
66	Ming Avenue	Castro Lane	Signalized	C - 108.0	11.0	B	10.6	B	48.6	D	57.6	E	16.7	B
67	Ming Avenue	H Street	Signalized	C - 82.0	41.0	D	37.6	D	21.1	C	17.7	B	29.6	C
68	Ming Avenue	Chester Avenue	Signalized	U - 113.2 (63.9)	26.4	C	23.9	C	22.5	C	20.9	C	23.7	C
69	White Lane	Wible Road	Signalized	C - 108.0	76.8	E	35.1	D	47.7	D	53.2	D	54.7	D
70	SR 99 SB Ramps	White Lane	Signalized	U - 90.0 (84.5)	24.7	C	16.5	B			21.2	C	22.3	C
71	SR 99 NB Ramps	White Lane	Signalized	U - 55.1 (61.1)	5.5	A	2.8	A	20.3	C			5.4	A
72	White Lane	Hughes Lane	Signalized	C - 108.0	26.8	C	35.3	D	49.2	D	46.2	D	35.9	D

Notes: ¹ "U" denotes an actuated-uncoordinated signal. "C" denotes an actuated-coordinated signal. For both uncoordinated and coordinated traffic signals, the value provided indicates the cycle length as given in the signal timing sheets. For uncoordinated signals, the number in parenthesis is the average cycle length as calculated by Synchro.

² For signalized and all-way stop-controlled intersections, the overall average intersection delay is reported in seconds per vehicle. For side-street stop control, the average control delay for the movement with the greatest delay is reported in seconds

³ Level of Service (LOS) based on *Highway Capacity Manual* (Transportation Research Board, 2000) methodology and Synchro 6.0 analysis software.

⁴ This signal was installed after the counts were collected.

Bold font and shading indicates unacceptable intersection operations based on the LOS C standard. LOS F conditions are highlighted in bold and red font.

Source: Fehr & Peers, 2010

Table 2 - Existing PM Conditions (Updated 12.3.10)
Intersection Level of Service Analysis

	East-West Street	North-South Street	Control	Signal Cycle Length (sec) ¹	EB Approach		WB Approach		NB Approach		SB Approach		Intersection	
					Delay ²	LOS ³	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 99 SB Ramps	Airport Drive / State Road	Signalized	U - 133.8 (118.9)	52.5	D	53.9	D	28.0	C	43.1	D	42.5	D
2	SR 99 NB Ramps	Airport Drive / Buck Owens Boulevard	Signalized	U - 85.3 (77.4)			31.3	C	14.6	B			21.9	C
3	Rio Mirada Drive	Buck Owens Boulevard	Signalized	U - 92.1 (59.7)	13.0	B	15.4	B	20.2	C	23.5	C	17.8	B
4	SR 99 NB Ramps	Buck Owens Boulevard / Sillect Avenue	Signalized	U - 152.7 (107.5)	46.3	D	46.2	D	30.9	C	36.2	D	37.5	D
5	Rosedale Highway	Allen Road	Signalized	U - 137.4 (133.0)	56.9	E	114.6	F	73.3	E	48.8	D	76.9	E
6	Rosedale Highway	Calloway Drive	Signalized	C - 140.0	46.8	D	44.9	D	197.2	F	110.7	F	91.0	F
7	Rosedale Highway	Coffee Road	Signalized	C - 140.0	64.0	E	74.4	E	61.8	E	57.1	E	66.7	E
8	Rosedale Highway	Mohawk Street	Unsignalized	--	0.0	A	18.2	C	53.2	D			53.2	F
9	Rosedale Highway	Camino del Rio Court	Signalized	C - 140.0	29.6	C	25.9	C	171.5	F	81.3	F	37.0	D
10	Rosedale Highway	SR 99 SB Ramps	Signalized	C - 140.0	3.0	A	5.0	A			389.0	F	44.5	D
11	Rosedale Highway	SR 99 NB Ramps	Signalized	C - 140.0	62.8	E	108.3	F	150.3	F	207.8	F	125.6	F
12	24th Street	Oak Street	Signalized	C - 159.4	81.3	F	127.0	F	84.7	F	88.2	F	100.3	F
19	Brimhall Road	Allen Road	Signalized	U - 115.0 (52.3)	17.5	B	17.0	B	17.9	B	25.0	C	19.9	B
22	Stockdale Highway	Allen Road	Signalized	U - 137.0 (81.1)	24.2	C	26.6	C	33.0	C	28.8	C	27.0	C
23	Brimhall Road	Calloway Drive	Signalized	U - 135.0 (76.6)	25.3	C	26.9	C	25.3	C	24.1	C	25.4	C
26	Stockdale Highway	Calloway Drive / Old River Road	Signalized	C - 108.0	45.9	D	35.0	D	41.3	D	32.8	C	38.5	D
27	Brimhall Road	Coffee Road	Signalized	U - 112.7 (78.1)	30.5	C	31.5	C	114.8	F	40.6	D	72.7	E
29	Truxtun Avenue	Coffee Road	Signalized	C - 108.0			107.5	F	57.4	E	69.2	E	81.2	F
30	Stockdale Highway	Coffee Road	Signalized	C - 108.0	64.6	E	196.3	F	80.5	F	45.2	D	90.2	F
35	Truxtun Avenue	Mohawk Street	Signalized	C - 108.0	28.3	C	39.2	D	63.4	E			41.5	D
36	California Avenue	Mohawk Street	Signalized	C - 108.0	40.5	D	70.7	E	24.4	C	32.3	C	34.3	C
37	Stockdale Highway	California Avenue	Signalized	C - 108.0	84.2	F	100.2	F	42.7	D	87.1	F	81.9	F
38	Truxtun Avenue	Oak Street	Signalized	C - 108.0	81.9	F	62.5	E	32.7	C	107.2	F	74.4	E
39	California Avenue	Chester Lane	Signalized	C - 108.0	24.1	C	17.3	B	54.7	D	59.2	E	27.8	C
40	SR 99 SB Ramps	California Avenue / Real Road	Signalized	C - 108.0	47.8	D	41.7	D	92.4	F	55.4	E	49.9	D
41	SR 99 NB Ramps	California Avenue	Signalized	C - 108.0	3.6	A	13.9	B	91.5	F	218.3	F	25.1	C
42	California Avenue	Oak Street	Signalized	C - 108.0	77.0	E	37.6	D	59.0	E	116.8	F	78.7	E
46	California Avenue	Union Avenue	Signalized	U - 112.7 (97.4)	38.1	D	37.3	D	36.7	D	32.2	C	36.0	D
47	Stockdale Highway	Real Road	Signalized	C - 108.0	57.2	E	32.7	C	261.1	F	114.1	F	93.2	F
48	SR 99 SB Ramps	Stockdale Highway	Signalized	C - 108.0	5.1	A	1.9	A			42.7	D	10.5	B
49	Stockdale Highway / Brundage Lane	Oak Street / Wible Road	Signalized	C - 108.0	18.5	B	51.2	D	44.0	D	48.6	D	38.8	D
50	SR 58 EB/WB Ramps	Real Road	Signalized	U - 159.4 (98.5)			25.7	C	37.0	D	24.4	C	27.3	C
51	SR 99 NB Ramps	Wible Road	Signalized	U - 107.8 (80.8)	28.4	C			15.1	B	42.0	D	32.2	C
52	Brundage Lane	H Street	Signalized	C - 88.0	49.6	D	41.0	D	18.7	B	34.2	C	35.3	D
53	SR 58 WB Ramps	H Street	Signalized	C - 88.0			88.3	F	5.7	A	68.8	E	56.3	E
54	SR 58 EB Ramps	H Street	Signalized	C - 88.0	57.7	E			54.9	D	1.7	A	27.2	C
55	Brundage Lane	Chester Avenue	Signalized	C - 88.0	57.5	E	41.2	D	17.7	B	20.0	C	30.7	C
56	SR 58 WB Ramps	Chester Avenue	Signalized	C - 88.0			36.3	D	6.2	A	26.9	C	23.9	C
57	SR 58 EB Ramps	Chester Avenue	Signalized	C - 88.0	43.2	D			26.1	C	12.8	B	22.2	C
58	Brundage Lane	Union Avenue	Signalized	U - 112.2 (94.0)	39.9	D	35.6	D	32.2	C	46.4	D	39.6	D
59	SR 58 WB Ramps	Union Avenue / Brundage Lane	Signalized	U - 103.3 (55.3)	13.1	B	13.1	B	17.1	B	30.9	C	15.1	B
60	SR 58 EB Ramps	Union Avenue	Signalized	U - 59.1 (49.8)	16.8	B			8.5	A	10.4	B	10.9	B
61	Ming Avenue	New Stine Road	Signalized	C - 108.0	114.5	F	65.5	E	60.6	E	65.4	E	79.6	E
62	Ming Avenue	Real Road	Signalized	C - 108.0	26.8	C	74.7	E	43.4	D	121.1	F	60.8	E
63	SR 99 SB Ramps	Ming Avenue	Signalized ⁴	C - 108.0	3.2	A	7.3	A	15.2	B	133.6	F	29.3	C
64	Ming Avenue	Wible Road	Signalized	C - 108.0	107.5	F	28.5	C	48.8	D	47.6	D	68.1	E
65	SR 99 NB Ramps	Ming Avenue	Signalized	C - 108.0	21.4	C	35.8	D	44.5	D	149.9	F	40.4	D
66	Ming Avenue	Castro Lane	Signalized	C - 108.0	11.5	B	17.3	B	49.5	D	93.2	F	24.7	C
67	Ming Avenue	H Street	Signalized	C - 88.0	43.6	D	53.6	D	23.4	C	23.3	C	35.5	D
68	Ming Avenue	Chester Avenue	Signalized	U - 113.2 (68.1)	26.7	C	25.5	C	22.2	C	22.2	C	24.0	C
69	White Lane	Wible Road	Signalized	C - 108.0	107.4	F	92.6	F	56.7	E	48.1	D	83.3	F
70	SR 99 SB Ramps	White Lane	Signalized	U - 90.0 (90.0)	117.7	F	30.8	C			131.9	F	109.5	F
71	SR 99 NB Ramps	White Lane	Signalized	U - 55.1 (51.1)	7.1	A	4.1	A	15.5	B			6.9	A
72	White Lane	Hughes Lane	Signalized	C - 108.0	30.3	C	35.2	D	57.7	E	43.2	D	38.3	D

Notes: ¹ "U" denotes an actuated-uncoordinated signal. "C" denotes an actuated-coordinated signal. For both uncoordinated and coordinated traffic signals, the value provided indicates the cycle length as given in the signal timing sheets. For uncoordinated signals, the number in parenthesis is the average cycle length as calculated by Synchro.

² For signalized and all-way stop-controlled intersections, the overall average intersection delay is reported in seconds per vehicle. For side-street stop control, the average control delay for the movement with the greatest delay is reported in seconds

³ Level of Service (LOS) based on *Highway Capacity Manual* (Transportation Research Board, 2000) methodology and Synchro 6.0 analysis software.

⁴ This signal was installed after the counts were collected.

Bold font and shading indicates unacceptable intersection operations based on the LOS C standard. LOS F conditions are highlighted in bold and red font.

Table 2 - Existing PM Conditions (Updated 12.3.10)
Intersection Level of Service Analysis

	East-West Street	North-South Street	Control	Signal Cycle Length (sec) ¹	EB Approach		WB Approach		NB Approach		SB Approach		Intersection	
					Delay ²	LOS ³	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 99 SB Ramps	Airport Drive / State Road	Signalized	U - 133.8 (118.9)	52.5	D	53.9	D	28.0	C	43.1	D	42.5	D
2	SR 99 NB Ramps	Airport Drive / Buck Owens Boulevard	Signalized	U - 85.3 (77.4)			31.3	C	14.6	B			21.9	C
3	Rio Mirada Drive	Buck Owens Boulevard	Signalized	U - 92.1 (59.7)	13.0	B	15.4	B	20.2	C	23.5	C	17.8	B
4	SR 99 NB Ramps	Buck Owens Boulevard / Sillect Avenue	Signalized	U - 152.7 (107.5)	46.3	D	46.2	D	30.9	C	36.2	D	37.5	D
5	Rosedale Highway	Allen Road	Signalized	U - 137.4 (133.0)	56.9	E	114.6	F	73.3	E	48.8	D	76.8	E
6	Rosedale Highway	Calloway Drive	Signalized	C - 140.0	46.8	D	44.9	D	197.2	F	110.7	F	91.0	F
7	Rosedale Highway	Coffee Road	Signalized	C - 140.0	64.0	E	74.4	E	61.8	E	57.1	E	65.7	E
8	Rosedale Highway	Mohawk Street	Unsignalized	C - 140.0	0.0	A	18.2	C	53.2	F			53.2	F
9	Rosedale Highway	Camino del Rio Court	Signalized	C - 140.0	29.6	C	25.9	C	171.5	F	81.3	F	37.0	D
10	Rosedale Highway	SR 99 SB Ramps	Signalized	C - 140.0	3.0	A	5.0	A			389.0	F	44.5	D
11	Rosedale Highway	SR 99 NB Ramps	Signalized	C - 140.0	62.8	E	108.3	F	150.3	F	207.8	F	125.6	F
12	24th Street	Oak Street	Signalized	C - 159.4	81.3	F	127.0	F	84.7	F	88.2	F	100.3	F
19	Brimhall Road	Allen Road	Signalized	U - 115.0 (52.3)	17.5	B	17.0	B	17.9	B	25.0	C	19.9	B
22	Stockdale Highway	Allen Road	Signalized	U - 137.0 (81.1)	24.2	C	26.6	C	33.0	C	28.8	C	27.0	C
23	Brimhall Road	Calloway Drive	Signalized	U - 135.0 (76.6)	25.3	C	26.9	C	25.3	C	24.1	C	25.4	C
26	Stockdale Highway	Calloway Drive / Old River Road	Signalized	C - 108.0	45.9	D	35.0	D	41.3	D	32.8	C	36.5	D
27	Brimhall Road	Coffee Road	Signalized	U - 112.7 (78.1)	30.5	C	31.5	C	114.8	F	40.6	D	72.7	E
29	Truxtun Avenue	Coffee Road	Signalized	C - 108.0			107.5	F	57.4	E	69.2	E	81.2	F
30	Stockdale Highway	Coffee Road	Signalized	C - 108.0	64.6	E	196.3	F	80.5	F	45.2	D	90.2	F
35	Truxtun Avenue	Mohawk Street	Signalized	C - 108.0	28.3	C	39.2	D	63.4	E			41.5	D
36	California Avenue	Mohawk Street	Signalized	C - 108.0	40.5	D	70.7	E	24.4	C	32.3	C	34.3	C
37	Stockdale Highway	California Avenue	Signalized	C - 108.0	84.2	F	100.2	F	42.7	D	87.1	F	81.9	F
38	Truxtun Avenue	Oak Street	Signalized	C - 108.0	81.9	F	62.5	E	32.7	C	107.2	F	74.4	E
39	California Avenue	Chester Lane	Signalized	C - 108.0	24.1	C	17.3	B	54.7	D	59.2	E	27.8	C
40	SR 99 SB Ramps	California Avenue / Real Road	Signalized	C - 108.0	47.8	D	41.7	D	92.4	F	55.4	E	49.9	D
41	SR 99 NB Ramps	California Avenue	Signalized	C - 108.0	3.6	A	13.9	B	91.5	F	218.3	F	25.1	C
42	California Avenue	Oak Street	Signalized	C - 108.0	77.0	E	37.6	D	59.0	E	116.8	F	78.7	E
46	California Avenue	Union Avenue	Signalized	U - 112.7 (97.4)	38.1	D	37.3	D	36.7	D	32.2	C	36.0	D
47	Stockdale Highway	Real Road	Signalized	C - 108.0	57.2	E	32.7	C	261.1	F	114.1	F	93.2	F
48	SR 99 SB Ramps	Stockdale Highway	Signalized	C - 108.0	5.1	A	1.9	A			42.7	D	10.5	B
49	Stockdale Highway / Brundage Lane	Oak Street / Wible Road	Signalized	C - 108.0	18.5	B	51.2	D	44.0	D	48.6	D	38.6	D
50	SR 58 EB/WB Ramps	Real Road	Signalized	U - 159.4 (98.5)			25.7	C	37.0	D	24.4	C	27.3	C
51	SR 99 NB Ramps	Wible Road	Signalized	U - 107.8 (80.8)	28.4	C			15.1	B	42.0	D	32.2	C

Notes: ¹ "U" denotes an actuated-uncoordinated signal. "C" denotes an actuated-coordinated signal. For both uncoordinated and coordinated traffic signals, the value provided indicates the cycle length as given in the signal timing sheets. For uncoordinated signals, the number in parenthesis is the average cycle length as calculated by Synchro.

² For signalized and all-way stop-controlled intersections, the overall average intersection delay is reported in seconds per vehicle. For side-street stop control, the average control delay for the movement with the greatest delay is reported in seconds

³ Level of Service (LOS) based on *Highway Capacity Manual* (Transportation Research Board, 2000) methodology and Synchro 6.0 analysis software.

⁴ This signal was installed after the counts were collected.

Bold font and shading indicates unacceptable intersection operations based on the LOS C standard. LOS F conditions are highlighted in bold and red font.

Source: Fehr & Peers, 2010

ATTACHMENT 1 – RESPONSES TO COMMENTS

THOMAS ROADS IMPROVEMENT PROGRAM

ENVIRONMENTAL PROCESS COMMENT/RESOLUTION FORM



REPORT: Existing Conditions Intersection Analysis		PROJECT: Centennial Corridor	
SUBMITTAL: <input type="checkbox"/> Screencheck <input type="checkbox"/> Preliminary <input checked="" type="checkbox"/> Draft <input type="checkbox"/> Final <input type="checkbox"/> Other:		CONSULTANT'S TRAFFIC MANAGER: Fred Choa, Fehr & Peers	
REVIEW TYPE: <input type="checkbox"/> City <input type="checkbox"/> County <input type="checkbox"/> Caltrans <input type="checkbox"/> HNTB <input checked="" type="checkbox"/> Other: Parsons		PHONE: (916)773-1900	EMAIL: f.choa@fehrandpeers.com
SUBMITTAL DATE:	DUE DATE:	SCHEDULED JRT MEETING DATE:	
REVIEWER: Ravi Puttagunta, Parsons		DISCIPLINE: Traffic Engineering	

No.	Page / Ref.	Reviewer's Comment	InitialDisp.	Consultants Response	Final Disp.	LS or NDC
1	All	The Synchro output printout sheets are not showing correct <u>signal cycle lengths</u> , it is very hard to assuming what signal time used for analysis. If consultants can add a column that shows existing field cycle lengths in the intersection analysis summary table.	C	The intersection analysis summary table will be modified to include a column that shows the signal cycle lengths that are on the signal timings sheets, whether the operations are coordinated or uncoordinated, and resulting field operating cycle lengths. For coordinated signals, both cycle lengths will be the same. For actuated signals, the cycle lengths will be different.		
2	#1	Please verify/check signal phasing for EB / WB left turn for #1 – State Road / Airport Drive.	C	The phasing for the EB and WB approaches operate separately based on field observations and signal timing sheets. The turn-type for the EB and WB phases will be set to split phasing to match these operations.		
3a	#12	#12 Rosedale / Oak Street – name should be 24 th Street / Oak Street.	C	The Synchro files and corresponding results summary tables and spreadsheets will be changed to show intersection #12 as 24 th Street / Oak Street		
3b	#12	#12 Rosedale / Oak Street – are these results consistent with 24 th Street Project existing conditions?	N	Yes, the LOS results are consistent with results provided by RBF for the 24 th Street Improvement Project – Existing Conditions Analysis		

CONSULTANTS INITIAL DISPOSITION CODES: C = Will Comply D = Discuss N = No Change A = Agency Action Required
TRIP FINAL DISPOSITION CODES: D = Done or Approved N/C = No Change Required
LS =Revise in Later Submittal **NDC** = Revise Immediately

THOMAS ROADS IMPROVEMENT PROGRAM

No.	Page / Ref.	Reviewer's Comment	InitialDisp.	Consultants Response	Final Disp.	LS or NDC
4	#38	#38 Truxtun Avenue / Oak Street – are these results consistent with 24 th Street Project existing conditions?	N	Yes, the level of service results are consistent with the 24 th Street Project existing conditions.		
5	#40	Intersection #40 – California Ave. / SR-99 SB Ramps – WBR is not a free conditions (When eastbound left's access to loop, WB rights has to yield, it should be overlap condition).	C	Based on the geometry of the intersection (see attached page), the WBR would operate with yield control based on the downstream merge of the Westbound right-turn and Eastbound left-turn traffic. The Synchro files will be updated to show this change and all analysis results tables and spreadsheets will be updated based on the change in operations results.		
6	#41	Please check intersection #41 – California Ave. / SR-99 NB Ramps – WBR lane geometry. Field conditions shows does not match with coding	N	The geometry and corresponding volumes used in the analysis correctly reflect the operating conditions of the five-legged intersection.		
7	Multiple	Following intersections lane geometry not consistent with AM and PM peak hours: a. #50 – SR-58 Ramps & Real Road b. #53 – SR-58 WB on-Ramp & H Street c. #54 – SR-58 EB off-Ramp & H Street d. #55 – Brundage Lane & Chester Avenue e. #58 – Brundage Lane & Union Avenue f. #63 – Ming Avenue & SR-99 SB Ramps g. #64 – Ming Avenue & Wible Road h. #65 – Ming Avenue & SR-99 NB Ramps i. #68 – Ming Avenue & Chester Avenue j. #69 – White Lane & Wible Road	C	The geometries in the Synchro files for all study intersections, including those shown to the left (a. through j.), will be modified to ensure consistency between the AM and PM Synchro files. The comment relates to u-turns that were only counted in the AM or PM peak hour and not the other.		

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REVIEWER SIGN & DATE: _____

CONSULTANT'S ENVIRO.
MANAGER SIGN & DATE: _____

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ATTACHMENT 2 – HCM CALCULATIONS

ATTACHMENT 1 – RESPONSES TO COMMENTS

THOMAS ROADS IMPROVEMENT PROGRAM

ENVIRONMENTAL PROCESS COMMENT/RESOLUTION FORM



REPORT: Existing Conditions Intersection Analysis		PROJECT: Centennial Corridor	
SUBMITTAL: <input type="checkbox"/> Screencheck <input type="checkbox"/> Preliminary <input checked="" type="checkbox"/> Draft <input type="checkbox"/> Final <input type="checkbox"/> Other:		CONSULTANT'S TRAFFIC MANAGER: Fred Choa, Fehr & Peers	
REVIEW TYPE: <input type="checkbox"/> City <input type="checkbox"/> County <input type="checkbox"/> Caltrans <input type="checkbox"/> HNTB <input checked="" type="checkbox"/> Other: Parsons		PHONE: (916)773-1900 EMAIL: f.choa@fehrandpeers.com	
SUBMITTAL DATE:		SCHEDULED JRT MEETING DATE:	
REVIEWER: Ravi Puttagunta, Parsons		DISCIPLINE: Traffic Engineering	

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THOMAS ROADS IMPROVEMENT PROGRAM

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ATTACHMENT 2 – HCM CALCULATIONS

HCM Signalized Intersection Capacity Analysis







1: State Road & Airport Drive

AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗	↘	↖	↗	↘	↖	↗	↘		↖	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.97	0.95	0.95	1.00	0.91	1.00		0.91	
Frpb, ped/bikes		1.00	1.00	1.00	0.99	0.99	1.00	1.00	1.00		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	0.94	0.85	1.00	1.00	0.85		1.00	
Flt Protected		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1719	1538	3335	1612	1440	1719	4940	1538		4919	
Flt Permitted		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00		1.00	
Satd. Flow (perm)		1719	1538	3335	1612	1440	1719	4940	1538		4919	
Volume (vph)	39	0	155	485	57	112	121	745	18	0	1124	30
Peak-hour factor, PHF	0.80	0.80	0.80	0.76	0.76	0.76	0.86	0.86	0.86	0.95	0.95	0.95
Adj. Flow (vph)	49	0	194	638	75	147	141	866	21	0	1183	32
RTOR Reduction (vph)	0	0	39	0	0	0	0	0	11	0	0	0
Lane Group Flow (vph)	0	49	155	638	121	101	141	866	10	0	1215	0
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Split		Perm	Split		Perm	Prot		Perm			
Protected Phases	7	7		8	8		5	2			6	
Permitted Phases			7			8			2			
Actuated Green, G (s)		19.8	19.8	26.8	26.8	26.8	13.3	50.1	50.1		33.1	
Effective Green, g (s)		20.7	20.7	27.7	27.7	27.7	13.0	51.4	51.4		34.4	
Actuated g/C Ratio		0.19	0.19	0.25	0.25	0.25	0.12	0.46	0.46		0.31	
Clearance Time (s)		4.9	4.9	4.9	4.9	4.9	3.7	5.3	5.3		5.3	
Vehicle Extension (s)		8.0	8.0	4.7	4.7	4.7	2.0	3.9	3.9		4.1	
Lane Grp Cap (vph)		318	285	826	399	357	200	2271	707		1514	
v/s Ratio Prot		0.03		c0.19	0.08		c0.08	0.18			c0.25	
v/s Ratio Perm			c0.10			0.07			0.01			
v/c Ratio		0.15	0.54	0.77	0.30	0.28	0.70	0.38	0.01		0.80	
Uniform Delay, d1		38.2	41.3	39.1	34.2	34.0	47.6	19.8	16.4		35.6	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2		1.0	6.8	5.1	0.8	0.8	8.9	0.1	0.0		3.4	
Delay (s)		39.2	48.1	44.3	35.0	34.8	56.4	19.9	16.4		39.0	
Level of Service		D	D	D	D	C	E	B	B		D	
Approach Delay (s)		46.3			41.9			24.9			39.0	
Approach LOS		D			D			C			D	
Intersection Summary												
HCM Average Control Delay		35.9										
HCM Volume to Capacity ratio		0.72										
Actuated Cycle Length (s)		111.8										
Intersection Capacity Utilization		59.7%										
Analysis Period (min)		15										
c Critical Lane Group												


HCM Signalized Intersection Capacity Analysis 2: Buck Owens Boulevard & Airport Drive

AM Peak Hour
Existing Conditions

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↰↰	↑↑↑↑	↱		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		0.88	0.81	0.81		
Flt		0.85	1.00	0.85		
Flt Protected		1.00	1.00	1.00		
Satd. Flow (prot)		2707	5700	1211		
Flt Permitted		1.00	1.00	1.00		
Satd. Flow (perm)		2707	5700	1211		
Volume (vph)	0	319	1430	78	0	0
Peak-hour factor, PHF	0.82	0.82	0.84	0.84	0.85	0.85
Adj. Flow (vph)	0	389	1702	93	0	0
RTOR Reduction (vph)	0	11	0	0	0	0
Lane Group Flow (vph)	0	378	1702	93	0	0
Heavy Vehicles (%)	5%	5%	8%	8%	2%	2%
Turn Type	custom			Free		
Protected Phases				2		
Permitted Phases	8			Free		
Actuated Green, G (s)	13.7		37.4	61.4		
Effective Green, g (s)	14.6		38.8	61.4		
Actuated g/C Ratio	0.24		0.63	1.00		
Clearance Time (s)	4.9		5.4			
Vehicle Extension (s)	3.2		5.7			
Lane Grp Cap (vph)	644		3602	1211		
v/s Ratio Prot			c0.30			
v/s Ratio Perm	c0.14		0.08			
v/c Ratio	0.59		0.47	0.08		
Uniform Delay, d1	20.7		5.9	0.0		
Progression Factor	1.00		1.00	1.00		
Incremental Delay, d2	1.4		0.3	0.1		
Delay (s)	22.1		6.2	0.1		
Level of Service	C		A	A		
Approach Delay (s)	22.1		5.9		0.0	
Approach LOS	C		A		A	
Intersection Summary						
HCM Average Control Delay	8.8			HCM Level of Service		A
HCM Volume to Capacity ratio	0.50					
Actuated Cycle Length (s)	61.4			Sum of lost time (s)		8.0
Intersection Capacity Utilization	39.0%			ICU Level of Service		A
Analysis Period (min)	15					
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis 3: Rio Mirada Drive & Buck Owens Boulevard

AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↗	↗	↗	↗	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.90			0.93		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1636			1661		1719	3438	1502	1719	3438	
Flt Permitted		1.00			0.88		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1629			1477		1719	3438	1502	1719	3438	
Volume (vph)	11	185	469	20	46	70	30	245	25	65	32	0
Peak-hour factor, PHF	0.79	0.79	0.79	0.81	0.81	0.81	0.93	0.93	0.93	0.62	0.62	0.62
Adj. Flow (vph)	14	234	594	25	57	86	32	263	27	105	52	0
RTOR Reduction (vph)	0	99	0	0	0	0	0	0	20	0	0	0
Lane Group Flow (vph)	0	743	0	0	168	0	32	263	7	105	52	0
Confl. Peds. (#/hr)	2					2			2			
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Perm			Perm			Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			
Actuated Green, G (s)		24.4			24.4		2.3	12.9	12.9	6.3	16.9	
Effective Green, g (s)		24.6			24.6		2.3	13.8	13.8	6.3	17.8	
Actuated g/C Ratio		0.43			0.43		0.04	0.24	0.24	0.11	0.31	
Clearance Time (s)		4.2			4.2		4.0	4.9	4.9	4.0	4.9	
Vehicle Extension (s)		1.5			1.5		1.0	2.0	2.0	1.5	2.0	
Lane Grp Cap (vph)		707			641		70	837	366	191	1079	
v/s Ratio Prot							0.02	c0.08		c0.06	c0.02	
v/s Ratio Perm		c0.46			0.11				0.00			
v/c Ratio		1.05			0.26		0.46	0.31	0.02	0.55	0.05	
Uniform Delay, d1		16.1			10.3		26.6	17.6	16.3	23.9	13.5	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		48.0			0.1		1.7	0.1	0.0	1.7	0.0	
Delay (s)		64.0			10.3		28.3	17.7	16.3	25.6	13.6	
Level of Service		E			B		C	B	B	C	B	
Approach Delay (s)		64.0			10.3			18.6			21.6	
Approach LOS		E			B			B			C	






















Intersection Summary

HCM Average Control Delay	43.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	56.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

4: Sillect Avenue & Buck Owens Boulevard

AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00		0.95	0.91			0.95	0.97	0.95	1.00	0.95
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	0.95			0.85	1.00	0.94	1.00	0.96
Flt Protected	0.95	1.00		0.95	0.97			1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1687	1697		1633	1485			1441	3099	3200	1719	3243
Flt Permitted	0.95	1.00		0.95	0.97			1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1687	1697		1633	1485			1441	3099	3200	1719	3243
Volume (vph)	495	224	103	130	0	25	22	190	320	236	46	286
Peak-hour factor, PHF	0.84	0.84	0.84	0.88	0.88	0.88	0.88	0.96	0.96	0.96	0.93	0.93
Adj. Flow (vph)	589	267	123	148	0	28	25	198	333	246	49	308
RTOR Reduction (vph)	0	0	0	0	0	0	22	0	0	0	0	0
Lane Group Flow (vph)	589	390	0	97	79	0	3	198	579	0	49	406
Confl. Peds. (#/hr)				2			2			2		
Heavy Vehicles (%)	7%	7%	6%	5%	5%	10%	5%	13%	5%	5%	5%	5%
Turn Type	Split			Split			Perm	Prot			Prot	
Protected Phases	4	4		3	3			5	2		1	6
Permitted Phases							3					
Actuated Green, G (s)	36.7	36.7		11.5	11.5		11.5	10.6	30.4		4.8	23.1
Effective Green, g (s)	36.9	36.9		11.2	11.2		11.2	11.8	31.0		4.5	23.7
Actuated g/C Ratio	0.37	0.37		0.11	0.11		0.11	0.12	0.31		0.05	0.24
Clearance Time (s)	4.2	4.2		3.7	3.7		3.7	5.2	4.6		3.7	4.6
Vehicle Extension (s)	4.1	4.1		4.1	4.1		4.1	2.0	5.5		2.0	5.5
Lane Grp Cap (vph)	625	629		184	167		162	367	996		78	772
v/s Ratio Prot	c0.35	0.23		c0.06	0.05			c0.06	c0.18		0.03	0.13
v/s Ratio Perm							0.00					
v/c Ratio	0.94	0.62		0.53	0.47		0.02	0.54	0.58		0.63	0.53
Uniform Delay, d1	30.3	25.6		41.7	41.4		39.3	41.3	28.8		46.7	33.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	23.0	2.2		3.7	3.0		0.1	0.8	1.5		10.8	1.4
Delay (s)	53.3	27.8		45.4	44.5		39.4	42.1	30.3		57.6	34.5
Level of Service	D	C		D	D		D	D	C		E	C
Approach Delay (s)		43.1			44.3				33.3			37.0
Approach LOS		D			D				C			D
Intersection Summary												
HCM Average Control Delay			38.9			HCM Level of Service			D			
HCM Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			99.6			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			70.4%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
4: Sillect Avenue & Buck Owens Boulevard

AM Peak Hour
Existing Conditions



























Movement	SBR2
LA 4 Configurations	
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Volume (vph)	91
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	98
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Heavy Vehicles (%)	13%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

5: Rosedale Highway & Allen Road

AM Peak Hour
Existing Conditions














												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3343	1516	1656	3112	1407	1736	1810	1487	1626	3369	1900
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3343	1516	1656	3112	1407	1736	1810	1487	1626	3369	1900
Volume (vph)	112	629	44	200	425	122	70	315	228	132	373	46
Peak-hour factor, PHF	0.94	0.94	0.94	0.92	0.92	0.92	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	119	669	47	217	462	133	79	354	256	142	401	49
RTOR Reduction (vph)	0	0	20	0	0	40	0	0	77	0	0	0
Lane Group Flow (vph)	119	669	27	217	462	93	79	354	179	142	450	0
Confl. Peds. (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	8%	5%	9%	16%	12%	4%	5%	7%	11%	5%	7%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	9.7	31.6	31.6	17.6	39.5	39.5	7.7	24.2	24.2	11.5	28.0	
Effective Green, g (s)	9.9	34.6	34.6	17.8	42.5	42.5	7.9	27.2	27.2	11.7	31.0	
Actuated g/C Ratio	0.09	0.32	0.32	0.17	0.40	0.40	0.07	0.25	0.25	0.11	0.29	
Clearance Time (s)	4.2	7.0	7.0	4.2	7.0	7.0	4.2	7.0	7.0	4.2	7.0	
Vehicle Extension (s)	2.0	6.0	6.0	2.0	5.3	5.3	2.0	3.1	3.1	2.0	2.4	
Lane Grp Cap (vph)	163	1078	489	275	1233	557	128	459	377	177	973	
v/s Ratio Prot	0.07	c0.20		c0.13	0.15		0.05	c0.20		c0.09	c0.13	
v/s Ratio Perm			0.02			0.07			0.12			
v/c Ratio	0.73	0.62	0.05	0.79	0.37	0.17	0.62	0.77	0.48	0.80	0.46	
Uniform Delay, d1	47.4	30.8	25.1	42.9	23.0	20.9	48.2	37.2	34.0	46.7	31.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	13.4	1.9	0.1	12.9	0.4	0.3	6.1	7.9	1.0	21.3	0.2	
Delay (s)	60.8	32.7	25.2	55.9	23.4	21.3	54.3	45.0	35.0	68.0	31.5	
Level of Service	E	C	C	E	C	C	D	D	C	E	C	
Approach Delay (s)		36.3			31.7			42.4			40.3	
Approach LOS		D			C			D			D	

Intersection Summary

HCM Average Control Delay	37.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	107.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis 6: Rosedale Highway & Calloway Drive

AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	0.99		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3252	1559	1641	3059	1446	1626	3198		3273	3438	1447
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3252	1559	1641	3059	1446	1626	3198		3273	3438	1447
Volume (vph)	152	1106	210	209	627	115	119	341	231	363	691	101
Peak-hour factor, PHF	0.86	0.86	0.86	0.90	0.90	0.90	0.88	0.88	0.88	0.89	0.89	0.89
Adj. Flow (vph)	177	1286	244	232	697	128	135	388	262	408	776	113
RTOR Reduction (vph)	0	0	38	0	0	38	0	0	0	0	0	34
Lane Group Flow (vph)	177	1286	206	232	697	90	135	650	0	408	776	79
Confl. Peds. (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	11%	2%	10%	18%	10%	11%	5%	6%	7%	5%	10%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	20.0	48.1	48.1	22.4	51.3	51.3	15.3	29.9		19.4	34.0	34.0
Effective Green, g (s)	19.4	51.0	51.0	22.6	54.2	54.2	14.7	31.6		18.8	35.7	35.7
Actuated g/C Ratio	0.14	0.36	0.36	0.16	0.39	0.39	0.10	0.23		0.13	0.26	0.26
Clearance Time (s)	3.4	6.9	6.9	4.2	6.9	6.9	3.4	5.7		3.4	5.7	5.7
Vehicle Extension (s)	2.0	5.9	5.9	2.0	6.5	6.5	2.0	4.3		2.0	4.3	4.3
Lane Grp Cap (vph)	245	1185	568	265	1184	560	171	722		440	877	369
v/s Ratio Prot	0.10	c0.40		c0.14	0.23		0.08	0.20		c0.12	c0.23	
v/s Ratio Perm			0.13			0.06						0.05
v/c Ratio	0.72	1.09	0.36	0.88	0.59	0.16	0.79	0.90		0.93	0.88	0.22
Uniform Delay, d1	57.7	44.5	32.6	57.3	34.1	28.0	61.1	52.7		59.9	50.2	41.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.6	52.5	1.8	25.2	2.2	0.6	19.6	14.8		25.2	11.0	0.5
Delay (s)	66.3	97.0	34.4	82.6	36.2	28.7	80.8	67.4		85.1	61.2	41.6
Level of Service	E	F	C	F	D	C	F	E		F	E	D
Approach Delay (s)		84.9			45.5			69.7			67.0	
Approach LOS		F			D			E			E	
























Intersection Summary

HCM Average Control Delay	69.0	HCM Level of Service	E
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis


7: Rosedale Highway & Coffee Road

AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3213	3282		3335	3167	1515	3155	4940	1515	3335	4940	1394
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3213	3282		3335	3167	1515	3155	4940	1515	3335	4940	1394
Volume (vph)	210	1361	160	132	801	136	174	679	443	345	748	50
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.87	0.87	0.87	0.90	0.90	0.90
Adj. Flow (vph)	226	1463	172	139	843	143	200	780	509	383	831	56
RTOR Reduction (vph)	0	0	0	0	0	43	0	0	153	0	0	39
Lane Group Flow (vph)	226	1635	0	139	843	100	200	780	356	383	831	17
Confl. Peds. (#/hr)			2			2			2			2
Heavy Vehicles (%)	9%	8%	9%	5%	14%	5%	11%	5%	5%	5%	5%	14%
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	8.0	57.7		10.1	59.8	59.8	12.9	29.0	29.0	18.6	34.7	34.7
Effective Green, g (s)	9.2	60.7		11.3	62.8	62.8	14.1	32.2	32.2	19.8	37.9	37.9
Actuated g/C Ratio	0.07	0.43		0.08	0.45	0.45	0.10	0.23	0.23	0.14	0.27	0.27
Clearance Time (s)	5.2	7.0		5.2	7.0	7.0	5.2	7.2	7.2	5.2	7.2	7.2
Vehicle Extension (s)	2.0	4.6		2.0	4.9	4.9	2.0	6.0	6.0	2.0	6.0	6.0
Lane Grp Cap (vph)	211	1423		269	1421	680	318	1136	348	472	1337	377
v/s Ratio Prot	0.07	c0.50		0.04	c0.27		0.06	0.16		c0.11	0.17	
v/s Ratio Perm						0.07			c0.23			0.01
v/c Ratio	1.07	1.15		0.52	0.59	0.15	0.63	0.69	1.02	0.81	0.62	0.04
Uniform Delay, d1	65.4	39.6		61.7	29.0	22.8	60.4	49.3	53.9	58.3	44.8	37.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	82.1	75.7		0.7	1.8	0.5	2.8	2.6	54.1	9.7	1.5	0.1
Delay (s)	147.5	115.3		62.4	30.8	23.2	63.2	51.9	108.0	68.0	46.3	37.8
Level of Service	F	F		E	C	C	E	D	F	E	D	D
Approach Delay (s)		119.2			33.8			72.6			52.5	
Approach LOS		F			C			E			D	
Intersection Summary												
HCM Average Control Delay		75.7					HCM Level of Service		E			
HCM Volume to Capacity ratio		1.02										
Actuated Cycle Length (s)		140.0					Sum of lost time (s)		16.0			
Intersection Capacity Utilization		90.2%					ICU Level of Service		E			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
8: Rosedale Highway & Mohawk Street

AM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↔	↕		↕	↕			↕			↕
Sign Control			Free			Free			Stop			Stop
Grade			0%			0%			0%			0%
Volume (veh/h)	16	0	2375	22	70	1530	7	2	0	30	0	0
Peak Hour Factor	0.91	0.91	0.91	0.91	0.90	0.90	0.90	0.86	0.86	0.86	0.25	0.25
Hourly flow rate (vph)	0	0	2610	24	78	1700	8	2	0	35	0	0
Pedestrians									2			2
Lane Width (ft)									12.0			12.0
Walking Speed (ft/s)									4.0			4.0
Percent Blockage									0			0
Right turn flare (veh)												
Median type									Raised			Raised
Median storage (veh)									1			1
Upstream signal (ft)												
pX, platoon unblocked	0.00											
vC, conflicting volume	0	1710			2612			3630	4489	1319	3201	4473
vC1, stage 1 conf vol								2624	2624		1861	1861
vC2, stage 2 conf vol								1006	1865		1340	2612
vCu, unblocked vol	0	1710			2612			3630	4489	1319	3201	4473
tC, single (s)	0.0	4.1			4.2			7.5	6.5	7.1	7.5	6.5
tC, 2 stage (s)								6.5	5.5		6.5	5.5
tF (s)	0.0	2.2			2.3			3.5	4.0	3.4	3.5	4.0
p0 queue free %	0	100			48			88	100	75	100	100
cM capacity (veh/h)	0	367			149			19	24	137	19	1
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	0	1740	894	78	1133	574	37	0				
Volume Left	0	0	0	78	0	0	2	0				
Volume Right	0	0	24	0	0	8	35	0				
cSH	1700	1700	1700	149	1700	1700	98	1700				
Volume to Capacity	0.00	1.02	0.53	0.52	0.67	0.34	0.38	0.00				
Queue Length 95th (ft)	0	0	0	64	0	0	38	0				
Control Delay (s)	0.0	0.0	0.0	52.9	0.0	0.0	62.4	0.0				
Lane LOS				F			F	A				
Approach Delay (s)	0.0			2.3			62.4	0.0				
Approach LOS							F	A				

Intersection Summary

Average Delay	1.4		
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		























HCM Unsignalized Intersection Capacity Analysis
8: Rosedale Highway & Mohawk Street

AM Peak Hour
Existing Conditions

Movement	SBR
Lane Configurations	
Sign Control	
Grade	
Volume (veh/h)	0
Peak Hour Factor	0.25
Hourly flow rate (vph)	0
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	856
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	856
tC, single (s)	6.9
tC, 2 stage (s)	
tF (s)	3.3
p0 queue free %	100
cM capacity (veh/h)	301
Direction, Lane #	

HCM Signalized Intersection Capacity Analysis
9: Rosedale Highway & Camino del Rio Court

AM Peak Hour
Existing Conditions

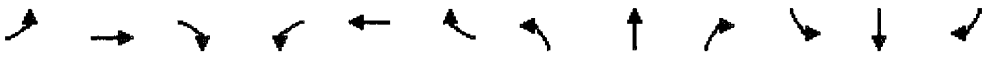
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		0.97	*0.84	1.00	1.00	1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (prot)	1719	4934		3367	4560	1514	1626	1517		1603	1622	1473
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00
Satd. Flow (perm)	1719	4934		3367	4560	1514	1626	1517		1603	1622	1473
Volume (vph)	38	2135	16	191	1767	88	19	4	163	76	4	37
Peak-hour factor, PHF	0.85	0.85	0.85	0.83	0.83	0.83	0.90	0.90	0.90	0.82	0.82	0.82
Adj. Flow (vph)	45	2512	19	230	2129	106	21	4	181	93	5	45
RTOR Reduction (vph)	0	0	0	0	0	28	0	0	0	0	0	42
Lane Group Flow (vph)	45	2531	0	230	2129	78	21	185	0	47	51	3
Confl. Peds. (#/hr)			2			2						2
Heavy Vehicles (%)	5%	5%	6%	4%	5%	5%	11%	2%	7%	7%	2%	8%
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6						4
Actuated Green, G (s)	8.0	85.1		12.6	89.7	89.7	14.0	14.0		9.4	9.4	9.4
Effective Green, g (s)	8.2	87.4		12.8	92.0	92.0	14.2	14.2		9.6	9.6	9.6
Actuated g/C Ratio	0.06	0.62		0.09	0.66	0.66	0.10	0.10		0.07	0.07	0.07
Clearance Time (s)	4.2	6.3		4.2	6.3	6.3	4.2	4.2		4.2	4.2	4.2
Vehicle Extension (s)	2.0	6.4		2.0	5.5	5.5	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	101	3080		308	2997	995	165	154		110	111	101
v/s Ratio Prot	0.03	c0.51		0.07	c0.47		0.01	c0.12		0.03	c0.03	
v/s Ratio Perm						0.05						0.00
v/c Ratio	0.45	0.82		0.75	0.71	0.08	0.13	1.20		0.43	0.46	0.03
Uniform Delay, d1	63.7	20.3		62.0	15.4	8.7	57.3	62.9		62.6	62.7	60.9
Progression Factor	1.00	1.00		0.85	0.91	0.57	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.1	2.6		6.1	1.1	0.1	0.1	136.8		1.0	1.1	0.0
Delay (s)	64.8	22.9		58.9	15.1	5.0	57.4	199.7		63.5	63.8	60.9
Level of Service	E	C		E	B	A	E	F		E	E	E
Approach Delay (s)		23.6			18.8			185.2			62.8	
Approach LOS		C			B			F			E	

Intersection Summary

HCM Average Control Delay	28.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			





















HCM Signalized Intersection Capacity Analysis
10: Rosedale Highway & SR-99 SB Ramps

AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑		↑↑↑	↑				↑	↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0				4.0	4.0	
Lane Util. Factor		0.86	0.86		0.91	1.00				0.95	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	0.98				1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00				1.00	1.00	
Frt		0.97	0.85		1.00	0.85				1.00	0.85	
Flt Protected		1.00	1.00		1.00	1.00				0.95	1.00	
Satd. Flow (prot)		4544	1270		4940	1437				1573	1434	
Flt Permitted		1.00	1.00		1.00	1.00				0.95	1.00	
Satd. Flow (perm)		4544	1270		4940	1437				1573	1434	
Volume (vph)	0	1457	917	0	1757	698	0	0	0	296	0	289
Peak-hour factor, PHF	0.85	0.85	0.85	0.84	0.84	0.84	0.92	0.92	0.92	0.84	0.84	0.84
Adj. Flow (vph)	0	1714	1079	0	2092	831	0	0	0	352	0	344
RTOR Reduction (vph)	0	22	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2070	701	0	2092	831	0	0	0	352	344	0
Confl. Peds. (#/hr)			2			2						
Heavy Vehicles (%)	2%	4%	8%	2%	5%	10%	2%	2%	2%	9%	2%	7%
Turn Type			Free			Free				Split		
Protected Phases		2			6					4	4	
Permitted Phases			Free			Free						
Actuated Green, G (s)		111.5	140.0		111.5	140.0				20.0	20.0	
Effective Green, g (s)		111.9	140.0		111.9	140.0				20.1	20.1	
Actuated g/C Ratio		0.80	1.00		0.80	1.00				0.14	0.14	
Clearance Time (s)		4.4			4.4					4.1	4.1	
Vehicle Extension (s)		4.5			4.5					4.1	4.1	
Lane Grp Cap (vph)		3632	1270		3948	1437				226	206	
v/s Ratio Prot		0.46			0.42					0.22	c0.24	
v/s Ratio Perm			0.55			c0.58						
v/c Ratio		0.57	0.55		0.53	0.58				1.56	1.67	
Uniform Delay, d1		5.2	0.0		4.9	0.0				60.0	60.0	
Progression Factor		0.72	1.00		0.52	1.00				1.00	1.00	
Incremental Delay, d2		0.4	0.9		0.0	0.2				271.4	321.9	
Delay (s)		4.1	0.9		2.6	0.2				331.4	381.8	
Level of Service		A	A		A	A				F	F	
Approach Delay (s)		3.3			1.9		0.0				356.3	
Approach LOS		A			A		A				F	
Intersection Summary												
HCM Average Control Delay		41.0					HCM Level of Service			D		
HCM Volume to Capacity ratio		0.74										
Actuated Cycle Length (s)		140.0					Sum of lost time (s)			4.0		
Intersection Capacity Utilization		58.7%					ICU Level of Service			B		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
11: Rosedale Highway & Buck Owens Boulevard























AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0		4.0	4.0		4.0
Lane Util. Factor	*0.90	*0.85			0.91	1.00	0.97		1.00	0.97		1.00
Frpb, ped/bikes	1.00	1.00			1.00	0.99	1.00		1.00	1.00		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00		1.00
Frt	1.00	1.00			1.00	0.85	1.00		0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00	0.95		1.00
Satd. Flow (prot)	2954	4704			4988	1513	3242		1583	3303		1417
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00	0.95		1.00
Satd. Flow (perm)	2954	4704			4988	1513	3242		1583	3303		1417
Volume (vph)	323	1430	0	0	1353	397	825	0	905	179	0	277
Peak-hour factor, PHF	0.90	0.90	0.90	0.78	0.78	0.78	0.80	0.80	0.80	0.89	0.89	0.89
Adj. Flow (vph)	359	1589	0	0	1735	509	1031	0	1131	201	0	311
RTOR Reduction (vph)	0	0	0	0	0	9	0	0	0	0	0	3
Lane Group Flow (vph)	359	1589	0	0	1735	500	1031	0	1131	201	0	308
Confl. Peds. (#/hr)						2						
Heavy Vehicles (%)	10%	3%	2%	2%	4%	6%	8%	2%	2%	6%	2%	14%
Turn Type	Prot				pm+ov		Prot		Free	Prot		custom
Protected Phases	5	2			6	4	8			4		5
Permitted Phases						6			Free			
Actuated Green, G (s)	19.0	69.3			45.1	105.0	39.0		140.0	59.9		35.7
Effective Green, g (s)	20.2	70.2			46.0	107.8	40.9		140.0	61.8		37.1
Actuated g/C Ratio	0.14	0.50			0.33	0.77	0.29		1.00	0.44		0.27
Clearance Time (s)	5.2	4.9			4.9	5.9	5.9			5.9		
Vehicle Extension (s)	2.0	4.5			4.5	4.5	3.3			4.5		
Lane Grp Cap (vph)	426	2359			1639	1208	947		1583	1458		376
v/s Ratio Prot	0.12	0.34			c0.35	0.18	c0.32			0.06		0.22
v/s Ratio Perm						0.15			c0.71			
v/c Ratio	0.84	0.67			1.06	0.41	1.09		0.71	0.14		0.82
Uniform Delay, d1	58.4	26.3			47.0	5.4	49.5		0.0	23.3		48.3
Progression Factor	0.92	0.86			1.00	1.00	1.00		1.00	1.00		1.00
Incremental Delay, d2	9.3	1.0			39.6	0.4	56.4		2.8	0.1		12.4
Delay (s)	63.1	23.6			86.6	5.8	106.0		2.8	23.3		60.7
Level of Service	E	C			F	A	F		A	C		E
Approach Delay (s)		30.9			68.3			52.0			46.0	
Approach LOS		C			E			D			D	
Intersection Summary												
HCM Average Control Delay		50.9										
HCM Volume to Capacity ratio		0.95										
Actuated Cycle Length (s)		140.0										
Intersection Capacity Utilization		76.8%										
Analysis Period (min)		15										
c Critical Lane Group												
HCM Level of Service										D		
Sum of lost time (s)										8.0		
ICU Level of Service										D		

HCM Signalized Intersection Capacity Analysis

12: 24th Street & Oak Street

AM Peak Hour
Existing Conditions


												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.99		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	
Satd. Flow (prot)	1770	3505	1558	3433	3497		1681	1693	1572		1752	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	
Satd. Flow (perm)	1770	3505	1558	3433	3497		1681	1693	1572		1752	
Volume (vph)	33	1920	561	603	1414	19	319	16	484	21	17	17
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	2182	638	685	1607	22	347	17	526	23	18	18
RTOR Reduction (vph)	0	0	106	0	0	0	0	0	105	0	0	0
Lane Group Flow (vph)	38	2182	532	685	1629	0	177	187	421	0	59	0
Confl. Peds. (#/hr)			2			2			2	2		
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot		Perm	Prot			Split		pm+ov	Split		
Protected Phases	5	2		1	6		8	8	1	7	7	
Permitted Phases			2						8			
Actuated Green, G (s)	17.6	80.8	80.8	25.0	90.2		24.5	24.5	49.5		7.7	
Effective Green, g (s)	17.8	82.7	82.7	26.2	91.1		26.4	26.4	52.6		8.1	
Actuated g/C Ratio	0.11	0.52	0.52	0.16	0.57		0.17	0.17	0.33		0.05	
Clearance Time (s)	4.2	5.9	5.9	5.2	4.9		5.9	5.9	5.2		4.4	
Vehicle Extension (s)	2.0	5.7	5.7	2.0	5.7		5.6	5.6	2.0		1.0	
Lane Grp Cap (vph)	198	1818	808	564	1999		278	280	558		89	
v/s Ratio Prot	0.02	c0.62		c0.20	0.47		0.11	0.11	c0.12		c0.03	
v/s Ratio Perm			0.34						0.14			
v/c Ratio	0.19	1.20	0.66	1.21	0.81		0.64	0.67	0.75		0.66	
Uniform Delay, d1	64.3	38.4	28.0	66.6	27.4		62.0	62.4	47.6		74.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.2	95.7	4.2	112.1	3.8		7.3	8.6	5.1		13.4	
Delay (s)	64.4	134.0	32.2	178.7	31.2		69.3	71.0	52.7		87.8	
Level of Service	E	F	C	F	C		E	E	D		F	
Approach Delay (s)		110.4			74.9			59.9			87.8	
Approach LOS		F			E			E			F	

Intersection Summary

HCM Average Control Delay	89.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	159.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	98.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis 19: Brimhall Road & Allen Road
























AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↱		↰	↱	↱	↰	↰↱	↱	↰	↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3415		1770	1863	1562	1770	3539	1562	1770	1863	1546
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3415		1770	1863	1562	1770	3539	1562	1770	1863	1546
Volume (vph)	22	333	86	35	122	93	22	339	75	146	381	16
Peak-hour factor, PHF	0.79	0.79	0.79	0.72	0.72	0.72	0.90	0.90	0.90	0.83	0.83	0.83
Adj. Flow (vph)	28	422	109	49	169	129	24	377	83	176	459	19
RTOR Reduction (vph)	0	0	0	0	0	89	0	0	59	0	0	6
Lane Group Flow (vph)	28	531	0	49	169	40	24	377	24	176	459	13
Confl. Peds. (#/hr)			2			2			2			2
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	1.8	16.4		3.4	18.0	18.0	1.8	17.2	17.2	8.3	23.7	23.7
Effective Green, g (s)	1.8	18.4		3.4	20.0	20.0	1.8	19.2	19.2	8.3	25.7	25.7
Actuated g/C Ratio	0.03	0.28		0.05	0.31	0.31	0.03	0.29	0.29	0.13	0.39	0.39
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	49	962		92	571	478	49	1041	459	225	733	608
v/s Ratio Prot	0.02	c0.16		c0.03	0.09		0.01	0.11		c0.10	c0.25	
v/s Ratio Perm						0.03			0.02			0.01
v/c Ratio	0.57	0.55		0.53	0.30	0.08	0.49	0.36	0.05	0.78	0.63	0.02
Uniform Delay, d1	31.4	19.9		30.2	17.3	16.1	31.3	18.2	16.5	27.6	15.9	12.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.6	0.4		2.9	0.1	0.0	2.8	0.1	0.0	15.0	1.2	0.0
Delay (s)	41.0	20.3		33.1	17.4	16.1	34.1	18.3	16.5	42.6	17.1	12.1
Level of Service	D	C		C	B	B	C	B	B	D	B	B
Approach Delay (s)		21.4			19.1			18.8			23.8	
Approach LOS		C			B			B			C	
Intersection Summary												
HCM Average Control Delay		21.2										
HCM Volume to Capacity ratio		0.60										
Actuated Cycle Length (s)		65.3										
Intersection Capacity Utilization		56.2%										
Analysis Period (min)		15										
c Critical Lane Group												
HCM Level of Service										C		
Sum of lost time (s)										12.0		
ICU Level of Service										B		

HCM Signalized Intersection Capacity Analysis

22: Stockdale Highway & Allen Road

AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	0.97	1.00	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5045		1770	5085	1546	3433	1863	1561	3433	3539	1561
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5045		1770	5085	1546	3433	1863	1561	3433	3539	1561
Volume (vph)	115	882	44	112	503	238	22	77	163	602	115	94
Peak-hour factor, PHF	0.68	0.68	0.68	0.80	0.80	0.80	0.89	0.89	0.89	0.82	0.82	0.82
Adj. Flow (vph)	169	1297	65	140	629	298	25	87	183	734	140	115
RTOR Reduction (vph)	0	0	0	0	0	59	0	0	36	0	0	70
Lane Group Flow (vph)	169	1362	0	140	629	239	25	87	147	734	140	45
Confl. Peds. (#/hr)			2			2			2			2
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	13.0	33.3		11.7	32.0	32.0	2.6	16.8	16.8	27.0	41.2	41.2
Effective Green, g (s)	13.5	35.3		12.2	34.0	34.0	3.1	18.8	18.8	27.5	43.2	43.2
Actuated g/C Ratio	0.12	0.32		0.11	0.31	0.31	0.03	0.17	0.17	0.25	0.39	0.39
Clearance Time (s)	4.5	6.0		4.5	6.0	6.0	4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0	1.5	2.0	2.0
Lane Grp Cap (vph)	218	1622		197	1575	479	97	319	267	860	1392	614
v/s Ratio Prot	c0.10	c0.27		0.08	0.12		0.01	0.05		c0.21	0.04	
v/s Ratio Perm						0.15			c0.09			0.03
v/c Ratio	0.78	0.84		0.71	0.40	0.50	0.26	0.27	0.55	0.85	0.10	0.07
Uniform Delay, d1	46.7	34.6		47.1	29.9	30.9	52.2	39.6	41.6	39.2	21.0	20.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.5	3.8		9.6	0.1	0.3	0.5	0.2	1.4	7.9	0.0	0.0
Delay (s)	61.1	38.5		56.7	29.9	31.2	52.7	39.7	43.0	47.2	21.0	20.8
Level of Service	E	D		E	C	C	D	D	D	D	C	C
Approach Delay (s)		41.0			33.8			42.9			40.4	
Approach LOS		D			C			D			D	

Intersection Summary

HCM Average Control Delay	39.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	109.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
23: Brimhall Road & Calloway Drive

AM Peak Hour
Existing Conditions

























Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↖↗	↖↗	↖↗	↖↗	↖	↖↗	↖↗↗	↖	↖↗	↖↗↗	↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	0.88	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	2747	3433	3539	1561	3433	5085	1561	3433	5085	1562
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	2747	3433	3539	1561	3433	5085	1561	3433	5085	1562
Volume (vph)	196	797	236	151	300	143	108	541	134	362	1070	126
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.87	0.87	0.87	0.79	0.79	0.79
Adj. Flow (vph)	213	866	257	172	341	162	124	622	154	458	1354	159
RTOR Reduction (vph)	0	0	52	0	0	32	0	0	31	0	0	32
Lane Group Flow (vph)	213	866	205	172	341	130	124	622	123	458	1354	127
Confl. Peds. (#/hr)			2			2			2			2
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	9.6	27.5	27.5	9.0	26.9	26.9	6.1	23.7	23.7	15.7	33.3	33.3
Effective Green, g (s)	9.6	29.5	29.5	9.0	28.9	28.9	6.1	25.7	25.7	15.7	35.3	35.3
Actuated g/C Ratio	0.10	0.31	0.31	0.09	0.30	0.30	0.06	0.27	0.27	0.16	0.37	0.37
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	1.0	2.0	2.0	1.5	2.0	2.0	1.5	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	344	1089	845	322	1066	470	218	1363	418	562	1872	575
v/s Ratio Prot	c0.06	c0.24		0.05	0.10		0.04	0.12		c0.13	c0.27	
v/s Ratio Perm			0.07			0.08			0.08			0.08
v/c Ratio	0.62	0.80	0.24	0.53	0.32	0.28	0.57	0.46	0.29	0.81	0.72	0.22
Uniform Delay, d1	41.4	30.4	24.8	41.5	25.9	25.5	43.6	29.3	27.9	38.7	26.1	20.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	3.8	0.1	0.9	0.1	0.1	2.0	0.1	0.1	8.4	1.2	0.1
Delay (s)	43.7	34.3	24.9	42.3	26.0	25.6	45.6	29.4	28.0	47.1	27.3	20.9
Level of Service	D	C	C	D	C	C	D	C	C	D	C	C
Approach Delay (s)		34.0			30.1			31.4			31.4	
Approach LOS		C			C			C			C	

Intersection Summary

HCM Average Control Delay	31.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	95.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			
























HCM Signalized Intersection Capacity Analysis
26: Stockdale Highway & Calloway Drive

AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5036	1561	3303	4631	1531	3242	5036	1545	3433	5036	1460
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5036	1561	3303	4631	1531	3242	5036	1545	3433	5036	1460
Volume (vph)	114	981	265	188	316	94	83	396	368	295	798	77
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.88	0.88	0.88	0.80	0.80	0.80
Adj. Flow (vph)	134	1154	312	221	372	111	94	450	418	369	998	96
RTOR Reduction (vph)	0	0	62	0	0	65	0	0	139	0	0	48
Lane Group Flow (vph)	134	1154	250	221	372	46	94	450	279	369	998	48
Confl. Peds. (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	3%	2%	6%	12%	4%	8%	3%	3%	2%	3%	9%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	7.3	39.0	39.0	11.0	42.7	42.7	10.8	22.4	22.4	14.6	26.2	26.2
Effective Green, g (s)	7.8	41.0	41.0	11.5	44.7	44.7	11.3	24.4	24.4	15.1	28.2	28.2
Actuated g/C Ratio	0.07	0.38	0.38	0.11	0.41	0.41	0.10	0.23	0.23	0.14	0.26	0.26
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	6.0	4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	248	1912	593	352	1917	634	339	1138	349	480	1315	381
v/s Ratio Prot	0.04	c0.23		c0.07	0.08		0.03	0.09		c0.11	c0.20	
v/s Ratio Perm			0.16			0.03			0.18			0.03
v/c Ratio	0.54	0.60	0.42	0.63	0.19	0.07	0.28	0.40	0.80	0.77	0.76	0.13
Uniform Delay, d1	48.4	27.0	24.7	46.2	20.2	19.1	44.6	35.5	39.5	44.8	36.8	30.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	1.4	2.2	2.5	0.2	0.2	0.2	0.1	11.3	6.6	2.3	0.1
Delay (s)	49.7	28.4	26.9	48.7	20.4	19.3	44.7	35.6	50.7	51.3	39.0	30.5
Level of Service	D	C	C	D	C	B	D	D	D	D	D	C
Approach Delay (s)		29.9			29.1			43.1			41.6	
Approach LOS		C			C			D			D	
Intersection Summary												
HCM Average Control Delay			36.1				HCM Level of Service			D		
HCM Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			108.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			65.9%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
27: Brimhall Road & Coffee Road

AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	1.00	0.88	1.00	1.00	1.00	0.97	0.91			1.00	0.91
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00			1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	3433	1863	2787	1770	1712	1447	3303	4911			1770	5036
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	3433	1863	2787	1770	1712	1447	3303	4911			1770	5036
Volume (vph)	515	32	1031	32	18	10	324	876	20	7	12	1301
Peak-hour factor, PHF	0.86	0.86	0.86	0.79	0.79	0.79	0.82	0.82	0.82	0.84	0.84	0.84
Adj. Flow (vph)	599	37	1199	41	23	13	395	1068	24	8	14	1549
RTOR Reduction (vph)	0	0	237	0	0	11	0	0	0	0	0	0
Lane Group Flow (vph)	599	37	962	41	23	2	395	1092	0	0	22	1549
Confl. Peds. (#/hr)						2			2			
Heavy Vehicles (%)	2%	2%	2%	2%	11%	10%	6%	5%	15%	2%	2%	3%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot	Prot	
Protected Phases	5	2		1	6		3	8		7	7	4
Permitted Phases			2			6						
Actuated Green, G (s)	27.0	35.1	35.1	3.9	12.0	12.0	12.7	33.5			2.1	22.9
Effective Green, g (s)	27.0	37.1	37.1	3.9	14.0	14.0	12.7	35.2			2.1	24.6
Actuated g/C Ratio	0.29	0.39	0.39	0.04	0.15	0.15	0.13	0.37			0.02	0.26
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	5.7			4.0	5.7
Vehicle Extension (s)	1.5	2.0	2.0	1.0	2.0	2.0	1.0	1.0			1.0	1.0
Lane Grp Cap (vph)	983	733	1096	73	254	215	445	1833			39	1314
v/s Ratio Prot	c0.17	0.02		0.02	0.01		c0.12	0.22			0.01	c0.31
v/s Ratio Perm			c0.35			0.00						
v/c Ratio	0.61	0.05	0.88	0.56	0.09	0.01	0.89	0.60			0.56	1.18
Uniform Delay, d1	29.1	17.7	26.5	44.4	34.7	34.2	40.1	23.8			45.6	34.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	0.7	0.0	7.9	5.8	0.1	0.0	18.4	0.3			10.7	88.7
Delay (s)	29.8	17.7	34.4	50.1	34.7	34.2	58.5	24.2			56.3	123.5
Level of Service	C	B	C	D	C	C	E	C			E	F
Approach Delay (s)		32.6			42.8			33.3				111.7
Approach LOS		C			D			C				F
Intersection Summary												
HCM Average Control Delay			60.1				HCM Level of Service			E		
HCM Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			94.3				Sum of lost time (s)		16.0			
Intersection Capacity Utilization			77.0%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												













HCM Signalized Intersection Capacity Analysis
27: Brimhall Road & Coffee Road

AM Peak Hour
Existing Conditions

Movement	SBR
Left Configurations	7
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1501
Flt Permitted	1.00
Satd. Flow (perm)	1501
Volume (vph)	175
Peak-hour factor, PHF	0.84
Adj. Flow (vph)	208
RTOR Reduction (vph)	41
Lane Group Flow (vph)	167
Confl. Peds. (#/hr)	2
Heavy Vehicles (%)	6%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	22.9
Effective Green, g (s)	24.6
Actuated g/C Ratio	0.26
Clearance Time (s)	5.7
Vehicle Extension (s)	1.0
Lane Grp Cap (vph)	392
v/s Ratio Prot	
v/s Ratio Perm	0.11
v/c Ratio	0.43
Uniform Delay, d1	29.0
Progression Factor	1.00
Incremental Delay, d2	0.3
Delay (s)	29.3
Level of Service	C
Approach Delay (s)	
Approach LOS	
Intersection Summary	























HCM Signalized Intersection Capacity Analysis
29: Truxtun Avenue & Coffee Road

AM Peak Hour
Existing Conditions

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	*0.75	0.95	0.88	*0.80	0.91
Frbp, ped/bikes	1.00	0.99	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3400	2307	3406	2744	2831	5036
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3400	2307	3406	2744	2831	5036
Volume (vph)	501	307	911	1680	1052	1262
Peak-hour factor, PHF	0.79	0.79	0.90	0.90	0.92	0.92
Adj. Flow (vph)	634	389	1012	1867	1143	1372
RTOR Reduction (vph)	0	15	0	7	0	0
Lane Group Flow (vph)	634	374	1012	1860	1143	1372
Confl. Peds. (#/hr)		2		2		
Heavy Vehicles (%)	3%	4%	6%	2%	2%	3%
Turn Type	pm+ov		pm+ov		Prot	
Protected Phases	4	1	2	4	1	6
Permitted Phases		4		2		
Actuated Green, G (s)	20.5	55.5	36.0	56.5	35.0	75.5
Effective Green, g (s)	22.5	58.0	38.0	60.5	35.5	77.5
Actuated g/C Ratio	0.21	0.54	0.35	0.56	0.33	0.72
Clearance Time (s)	6.0	4.5	6.0	6.0	4.5	6.0
Vehicle Extension (s)	2.0	1.5	2.0	2.0	1.5	2.0
Lane Grp Cap (vph)	708	1324	1198	1639	931	3614
v/s Ratio Prot	0.19	0.09	0.30	c0.24	c0.40	0.27
v/s Ratio Perm		0.07		0.44		
v/c Ratio	0.90	0.28	0.84	1.13	1.23	0.38
Uniform Delay, d1	41.6	13.6	32.3	23.8	36.2	5.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.6	0.0	7.4	68.8	112.0	0.3
Delay (s)	55.2	13.7	39.7	92.6	148.3	6.2
Level of Service	E	B	D	F	F	A
Approach Delay (s)	39.4		74.0			70.8
Approach LOS	D		E			E
Intersection Summary						
HCM Average Control Delay	67.2		HCM Level of Service		E	
HCM Volume to Capacity ratio	1.17					
Actuated Cycle Length (s)	108.0		Sum of lost time (s)		8.0	
Intersection Capacity Utilization	95.7%		ICU Level of Service		F	
Analysis Period (min)	15					
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
30: Stockdale Highway & Coffee Road

AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91		0.97	0.91		0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4988	1473	3367	4675		3433	4999		3400	4988	1531
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4988	1473	3367	4675		3433	4999		3400	4988	1531
Volume (vph)	729	1068	70	247	815	318	253	1555	169	432	896	435
Peak-hour factor, PHF	0.86	0.86	0.86	0.84	0.84	0.84	0.88	0.88	0.88	0.86	0.86	0.86
Adj. Flow (vph)	848	1242	81	294	970	379	288	1767	192	502	1042	506
RTOR Reduction (vph)	0	0	24	0	0	0	0	0	0	0	0	101
Lane Group Flow (vph)	848	1242	57	294	1349	0	288	1959	0	502	1042	405
Confl. Peds. (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	4%	8%	4%	5%	8%	2%	2%	3%	3%	4%	4%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8									2
Actuated Green, G (s)	19.2	29.4	29.4	11.8	22.0		12.0	34.8		12.0	34.8	34.8
Effective Green, g (s)	19.2	31.4	31.4	11.8	24.0		12.0	36.8		12.0	36.8	36.8
Actuated g/C Ratio	0.18	0.29	0.29	0.11	0.22		0.11	0.34		0.11	0.34	0.34
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)	610	1450	428	368	1039		381	1703		378	1700	522
v/s Ratio Prot	c0.25	0.25		0.09	c0.29		0.08	c0.39		c0.15	0.21	
v/s Ratio Perm			0.04									0.26
v/c Ratio	1.39	0.86	0.13	0.80	1.30		0.76	1.15		1.33	0.61	0.78
Uniform Delay, d1	44.4	36.2	28.3	46.9	42.0		46.6	35.6		48.0	29.7	31.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	185.5	6.7	0.6	10.8	141.4		7.4	74.9		164.9	1.7	10.8
Delay (s)	229.9	42.9	28.9	57.7	183.4		54.0	110.5		212.9	31.3	42.7
Level of Service	F	D	C	E	F		D	F		F	C	D
Approach Delay (s)		115.4			160.9			103.3			78.6	
Approach LOS		F			F			F			E	

Intersection Summary

HCM Average Control Delay	112.0	HCM Level of Service	F
HCM Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	103.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
35: Truxtun Avenue & Mohawk Street























AM Peak Hour
Existing Conditions

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑↑	↑↑	↑↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	0.88
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3539	1561	3400	3505	3433	2740
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3539	1561	3400	3505	3433	2740
Volume (vph)	2034	601	201	706	318	365
Peak-hour factor, PHF	0.89	0.89	0.77	0.77	0.80	0.80
Adj. Flow (vph)	2285	675	261	917	398	456
RTOR Reduction (vph)	0	139	0	0	0	13
Lane Group Flow (vph)	2285	536	261	917	398	443
Confl. Peds. (#/hr)		2				2
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Turn Type		Perm	Prot		custom	
Protected Phases	2		1	6	7	1
Permitted Phases		2				4
Actuated Green, G (s)	70.4	70.4	8.0	82.4	15.6	23.6
Effective Green, g (s)	72.4	72.4	8.0	84.4	15.6	23.6
Actuated g/C Ratio	0.67	0.67	0.07	0.78	0.14	0.22
Clearance Time (s)	6.0	6.0	4.0	6.0	4.0	4.0
Vehicle Extension (s)	2.0	2.0	1.5	2.0	2.0	1.5
Lane Grp Cap (vph)	2372	1046	252	2739	496	700
v/s Ratio Prot	c0.65		c0.08	0.26	c0.12	0.05
v/s Ratio Perm		0.34				0.11
v/c Ratio	0.96	0.51	1.04	0.33	0.80	0.63
Uniform Delay, d1	16.6	8.9	50.0	3.5	44.7	38.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.7	1.8	66.3	0.3	8.6	1.4
Delay (s)	28.2	10.7	116.3	3.8	53.3	39.6
Level of Service	C	B	F	A	D	D
Approach Delay (s)	24.2			28.7	46.0	
Approach LOS	C			C	D	

Intersection Summary			
HCM Average Control Delay	29.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			























HCM Signalized Intersection Capacity Analysis 36: Mohawk Street & California Avenue

AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.95	0.95	0.88	0.95	0.95		0.97	0.91		1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	0.97	1.00	0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1681	1691	2769	1665	1606		3433	5013		1770	4988	1560
Flt Permitted	0.95	0.97	1.00	0.95	0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1681	1691	2769	1665	1606		3433	5013		1770	4988	1560
Volume (vph)	343	77	171	39	13	13	548	1089	96	74	720	303
Peak-hour factor, PHF	0.82	0.82	0.82	0.71	0.71	0.71	0.79	0.79	0.79	0.83	0.83	0.83
Adj. Flow (vph)	418	94	209	55	18	18	694	1378	122	89	867	365
RTOR Reduction (vph)	0	0	41	0	0	0	0	0	0	0	0	72
Lane Group Flow (vph)	254	258	168	46	45	0	694	1500	0	89	867	293
Confl. Peds. (#/hr)			2	2					2			2
Heavy Vehicles (%)	2%	6%	2%	3%	2%	8%	2%	2%	2%	2%	4%	2%
Turn Type	Split	pm+ov		Split			Prot			Prot		Perm
Protected Phases	4	4	5	3	3		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	19.7	19.7	49.4	5.1	5.1		29.7	58.1		6.8	35.2	35.2
Effective Green, g (s)	21.0	21.0	50.7	5.1	5.1		29.7	59.1		6.8	36.2	36.2
Actuated g/C Ratio	0.19	0.19	0.47	0.05	0.05		0.27	0.55		0.06	0.34	0.34
Clearance Time (s)	5.3	5.3	4.0	4.0	4.0		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.0	2.0	1.0	1.5	1.5		1.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)	327	329	1402	79	76		944	2743		111	1672	523
v/s Ratio Prot	0.15	c0.15	0.03	0.03	c0.03		c0.20	0.30		c0.05	0.17	
v/s Ratio Perm			0.03									c0.19
v/c Ratio	0.78	0.78	0.12	0.58	0.59		0.74	0.55		0.80	0.52	0.56
Uniform Delay, d1	41.3	41.3	16.1	50.4	50.4		35.6	15.8		49.9	28.9	29.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.1	10.7	0.0	6.9	8.0		2.6	0.8		31.1	1.2	4.3
Delay (s)	51.4	52.1	16.1	57.3	58.4		38.2	16.6		81.1	30.0	33.7
Level of Service	D	D	B	E	E		D	B		F	C	C
Approach Delay (s)		41.4			57.8			23.4			34.5	
Approach LOS		D			E			C			C	
Intersection Summary												
HCM Average Control Delay			30.5			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			108.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			63.8%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
37: Stockdale Highway & California Avenue

























AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	0.97	0.91		0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4951		3273	4759	1560	3400	4995		3303	4893	1474
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4951		3273	4759	1560	3400	4995		3303	4893	1474
Volume (vph)	800	1162	125	127	1000	112	235	775	83	189	431	332
Peak-hour factor, PHF	0.90	0.90	0.90	0.77	0.77	0.77	0.77	0.77	0.77	0.87	0.87	0.87
Adj. Flow (vph)	889	1291	139	165	1299	145	305	1006	108	217	495	382
RTOR Reduction (vph)	0	0	0	0	0	36	0	0	0	0	0	96
Lane Group Flow (vph)	889	1430	0	165	1299	109	305	1114	0	217	495	286
Confl. Peds. (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	3%	4%	7%	9%	2%	3%	2%	4%	6%	6%	8%
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	27.6	45.0		8.6	26.0	26.0	10.5	26.1		9.7	25.3	25.3
Effective Green, g (s)	27.6	46.3		8.6	27.3	27.3	10.5	27.4		9.7	26.6	26.6
Actuated g/C Ratio	0.26	0.43		0.08	0.25	0.25	0.10	0.25		0.09	0.25	0.25
Clearance Time (s)	4.0	5.3		4.0	5.3	5.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	0.5	2.0		0.5	2.0	2.0	0.5	2.0		0.5	2.0	2.0
Lane Grp Cap (vph)	877	2123		261	1203	394	331	1267		297	1205	363
v/s Ratio Prot	c0.26	0.29		0.05	c0.27		0.09	c0.22		0.07	0.10	
v/s Ratio Perm						0.07						c0.19
v/c Ratio	1.01	0.67		0.63	1.08	0.28	0.92	0.88		0.73	0.41	0.79
Uniform Delay, d1	40.2	24.8		48.2	40.4	32.4	48.3	38.7		47.9	34.1	38.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	33.8	0.7		3.6	50.4	0.1	29.7	8.9		7.7	1.0	15.7
Delay (s)	74.0	25.5		51.8	90.7	32.6	78.0	47.6		55.6	35.2	53.8
Level of Service	E	C		D	F	C	E	D		E	D	D
Approach Delay (s)		44.1			81.5			54.1			45.7	
Approach LOS		D			F			D			D	
Intersection Summary												
HCM Average Control Delay		55.9										
HCM Volume to Capacity ratio		0.95										
Actuated Cycle Length (s)		108.0										
Intersection Capacity Utilization		84.7%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

38: Truxtun Avenue & Oak Street

AM Peak Hour
Existing Conditions

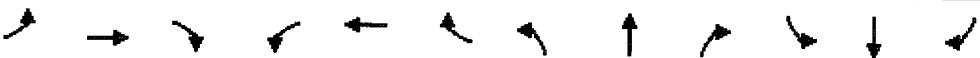
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	*0.83	0.95	1.00	*0.85	0.95	1.00	0.97	0.95	1.00	0.97	*0.75	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	2938	3539	1583	3008	3539	1560	3433	3539	1560	3433	2794	1573
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	2938	3539	1583	3008	3539	1560	3433	3539	1560	3433	2794	1573
Volume (vph)	535	991	163	178	336	49	464	645	554	99	369	497
Peak-hour factor, PHF	0.76	0.76	0.76	0.90	0.90	0.90	0.85	0.85	0.85	0.94	0.94	0.94
Adj. Flow (vph)	704	1304	214	198	373	54	546	759	652	105	393	529
RTOR Reduction (vph)	0	0	43	0	0	46	0	0	130	0	0	28
Lane Group Flow (vph)	704	1304	171	198	373	8	546	759	522	105	393	501
Confl. Peds. (#/hr)						2			2			2
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		pm+ov
Protected Phases	3	8		7	4		1	6		5	2	3
Permitted Phases			8			4			6			2
Actuated Green, G (s)	30.7	37.0	37.0	9.3	15.6	15.6	18.8	36.4	36.4	7.1	24.7	55.4
Effective Green, g (s)	30.7	38.3	38.3	9.3	16.9	16.9	18.8	37.3	37.3	7.1	25.6	56.3
Actuated g/C Ratio	0.28	0.35	0.35	0.09	0.16	0.16	0.17	0.35	0.35	0.07	0.24	0.52
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	4.9	4.9	4.0	4.9	4.0
Vehicle Extension (s)	0.5	2.0	2.0	0.5	2.0	2.0	0.5	2.0	2.0	0.5	2.0	0.5
Lane Grp Cap (vph)	835	1255	561	259	554	244	598	1222	539	226	662	820
v/s Ratio Prot	0.24	c0.37		0.07	c0.11		0.16	0.21		0.03	0.14	c0.17
v/s Ratio Perm			0.11			0.01			c0.33			0.14
v/c Ratio	0.84	1.04	0.31	0.76	0.67	0.03	0.91	0.62	0.97	0.46	0.59	0.61
Uniform Delay, d1	36.4	34.9	25.2	48.3	42.9	38.6	43.8	29.5	34.8	48.6	36.6	18.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.87	0.44	0.34	1.00	1.00	1.00
Incremental Delay, d2	7.5	36.1	0.1	11.4	2.5	0.0	12.0	1.4	23.2	0.6	3.9	1.0
Delay (s)	43.8	71.0	25.3	59.7	45.5	38.7	50.2	14.5	35.1	49.2	40.5	19.1
Level of Service	D	E	C	E	D	D	D	B	D	D	D	B
Approach Delay (s)		58.0			49.4			31.3			30.4	
Approach LOS		E			D			C			C	

Intersection Summary

HCM Average Control Delay	43.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
39: California Avenue & Chester Lane

AM Peak Hour
Existing Conditions


												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑		↰	↑↑↑		↰	↑↑		↰	↑↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		0.95	0.95		0.95	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.92		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.97	
Satd. Flow (prot)	1770	5051		1719	5058		1681	1611		1588	1568	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.97	
Satd. Flow (perm)	1770	5051		1719	5058		1681	1611		1588	1568	
Volume (vph)	24	973	17	21	1315	42	74	25	35	115	11	10
Peak-hour factor, PHF	0.86	0.86	0.86	0.82	0.82	0.82	0.86	0.86	0.86	0.74	0.74	0.74
Adj. Flow (vph)	28	1131	20	26	1604	51	86	29	41	155	15	14
RTQR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	28	1151	0	26	1655	0	80	76	0	94	90	0
Confl. Peds. (#/hr)			2			2	3					3
Heavy Vehicles (%)	2%	2%	24%	5%	2%	2%	2%	2%	3%	8%	9%	10%
Turn Type	Prot			Prot			Split			Split		
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases												
Actuated Green, G (s)	4.5	67.6		2.7	65.8		7.9	7.9		11.8	11.8	
Effective Green, g (s)	4.5	68.6		2.7	66.8		7.9	7.9		12.8	12.8	
Actuated g/C Ratio	0.04	0.64		0.03	0.62		0.07	0.07		0.12	0.12	
Clearance Time (s)	4.0	5.0		4.0	5.0		4.0	4.0		5.0	5.0	
Vehicle Extension (s)	1.0	3.0		1.0	3.0		1.5	1.5		1.5	1.5	
Lane Grp Cap (vph)	74	3208		43	3128		123	118		188	186	
v/s Ratio Prot	c0.02	0.23		0.02	c0.33		c0.05	0.05		c0.06	0.06	
v/s Ratio Perm												
v/c Ratio	0.38	0.36		0.60	0.53		0.65	0.64		0.50	0.48	
Uniform Delay, d1	50.4	9.3		52.1	11.7		48.7	48.7		44.6	44.5	
Progression Factor	1.00	1.00		1.12	1.23		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.2	0.3		9.9	0.4		9.0	8.7		0.8	0.7	
Delay (s)	51.6	9.6		68.4	14.8		57.7	57.4		45.4	45.2	
Level of Service	D	A		E	B		E	E		D	D	
Approach Delay (s)		10.6			15.7			57.6			45.3	
Approach LOS		B			B			E			D	

Intersection Summary

HCM Average Control Delay	17.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
40: California Avenue & SR-99 SB Ramps

AM Peak Hour
Existing Conditions





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↰↰		↰	↰↰↰	↰	↰	↰	↰↰	↰	↰	↰
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	1.00	1.00	0.88	1.00	0.95	0.95
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	0.99	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.89	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5003		1770	5085	1532	1736	1712	2733	1752	1543	1481
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5003		1770	5085	1532	1736	1712	2733	1752	1543	1481
Volume (vph)	114	1027	41	89	880	181	72	42	233	256	113	708
Peak-hour factor, PHF	0.81	0.81	0.81	0.91	0.91	0.91	0.77	0.77	0.77	0.88	0.88	0.88
Adj. Flow (vph)	141	1268	51	98	967	199	94	55	303	291	128	805
RTOR Reduction (vph)	0	0	0	0	0	125	0	0	61	0	0	0
Lane Group Flow (vph)	141	1319	0	98	967	74	94	55	243	291	501	432
Confl. Peds. (#/hr)						2	3					3
Heavy Vehicles (%)	2%	3%	5%	2%	2%	3%	4%	11%	4%	3%	5%	2%
Turn Type	Prot			Prot		Perm	Split		Perm	Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6			3			4
Actuated Green, G (s)	12.3	41.4		9.6	38.7	38.7	9.0	9.0	9.0	31.0	31.0	31.0
Effective Green, g (s)	12.0	42.7		9.3	40.0	40.0	9.0	9.0	9.0	31.0	31.0	31.0
Actuated g/C Ratio	0.11	0.40		0.09	0.37	0.37	0.08	0.08	0.08	0.29	0.29	0.29
Clearance Time (s)	3.7	5.3		3.7	5.3	5.3	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.1		2.0	4.5	4.5	4.5	4.5	4.5	7.1	7.1	7.1
Lane Grp Cap (vph)	197	1978		152	1883	567	145	143	228	503	443	425
v/s Ratio Prot	0.08	c0.26		0.06	c0.19		0.05	0.03		0.17	c0.32	
v/s Ratio Perm						0.05			c0.09			0.29
v/c Ratio	0.72	0.67		0.64	0.51	0.13	0.65	0.38	1.06	0.58	1.13	1.02
Uniform Delay, d1	46.4	26.8		47.8	26.4	22.5	48.0	46.9	49.5	32.9	38.5	38.5
Progression Factor	1.06	0.79		0.64	0.64	0.40	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.4	1.7		3.8	0.6	0.0	11.7	3.0	77.4	3.9	83.6	47.9
Delay (s)	58.4	22.9		34.2	17.6	9.0	59.6	49.8	126.9	36.8	122.1	86.4
Level of Service	E	C		C	B	A	E	D	F	D	F	F
Approach Delay (s)		26.3			17.5			103.6			89.2	
Approach LOS		C			B			F			F	

Intersection Summary

HCM Average Control Delay	49.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis 41: California Avenue & SR 99 NB Ramps

AM Peak Hour
Existing Conditions

												
Movement	EBL2	EBL	EBT	EBR	WBT	WBR	WBR2	NBL2	NBT	NBR	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0
Lane Util. Factor		1.00	0.91	1.00	0.86		0.86	0.95	0.95	1.00		1.00
Frpb, ped/bikes		1.00	1.00	0.98	0.99		0.97	1.00	1.00	0.99		1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00
Frt		1.00	1.00	0.85	0.97		0.85	1.00	1.00	0.85		0.92
Flt Protected		0.95	1.00	1.00	1.00		1.00	0.95	0.96	1.00		0.98
Satd. Flow (prot)		1770	5085	1504	4565		1109	1681	1687	1561		1497
Flt Permitted		0.95	1.00	1.00	1.00		1.00	0.95	0.96	1.00		0.76
Satd. Flow (perm)		1770	5085	1504	4565		1109	1681	1687	1561		1163
Volume (vph)	6	16	1038	456	739	216	9	391	27	713	17	0
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.85	0.85	0.85	0.88	0.88	0.88	0.60	0.60
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	100%	125%	100%	100%
Adj. Flow (vph)	7	19	1207	530	869	254	11	444	31	1013	28	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	33	0	0
Lane Group Flow (vph)	0	26	1207	530	1123	0	11	236	239	980	0	71
Confl. Peds. (#/hr)				4		2	2			2	2	
Heavy Vehicles (%)	2%	2%	2%	5%	2%	7%	22%	2%	6%	2%	12%	2%
Turn Type	Prot	Prot		Free			Perm	Split	Prot	Perm	Perm	
Protected Phases	5	5	2		6			3	3			4
Permitted Phases				Free			6			3	4	
Actuated Green, G (s)		6.6	30.8	108.0	20.1		20.1	56.0	56.0	56.0		8.0
Effective Green, g (s)		6.3	31.7	108.0	21.4		21.4	56.6	56.6	56.6		7.7
Actuated g/C Ratio		0.06	0.29	1.00	0.20		0.20	0.52	0.52	0.52		0.07
Clearance Time (s)		3.7	4.9		5.3		5.3	4.6	4.6	4.6		3.7
Vehicle Extension (s)		2.0	5.1		4.2		4.2	5.0	5.0	5.0		1.5
Lane Grp Cap (vph)		103	1493	1504	905		220	881	884	818		83
v/s Ratio Prot		0.01	c0.24		c0.25			0.14	0.14			
v/s Ratio Perm				0.35			0.01			c0.63		c0.06
v/c Ratio		0.25	0.81	0.35	1.24		0.05	0.27	0.27	1.20		0.86
Uniform Delay, d1		48.6	35.3	0.0	43.3		35.1	14.2	14.3	25.7		49.6
Progression Factor		0.76	0.49	1.00	0.71		0.47	1.00	1.00	1.00		1.00
Incremental Delay, d2		0.3	3.3	0.5	116.2		0.4	0.3	0.3	100.7		52.0
Delay (s)		37.5	20.5	0.5	147.0		16.7	14.6	14.6	126.4		101.6
Level of Service		D	C	A	F		B	B	B	F		F
Approach Delay (s)			14.7		145.8				90.7			101.6
Approach LOS			B		F				F			F

Intersection Summary

HCM Average Control Delay	74.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

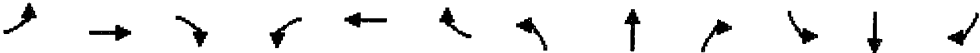
HCM Signalized Intersection Capacity Analysis
41: California Avenue & SR 99 NB Ramps

AM Peak Hour
Existing Conditions

Movement	SBR	SBR2
Lane Configurations		
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)		
Lane Util. Factor		
Frbp, ped/bikes		
Flpb, ped/bikes		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Volume (vph)	20	6
Peak-hour factor, PHF	0.60	0.60
Growth Factor (vph)	100%	100%
Adj. Flow (vph)	33	10
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	12%	28%
Turn Type		
Protected Phases		
Permitted Phases		
Actuated Green, G (s)		
Effective Green, g (s)		
Actuated g/C Ratio		
Clearance Time (s)		
Vehicle Extension (s)		
Lane Grp Cap (vph)		
v/s Ratio Prot		
v/s Ratio Perm		
v/c Ratio		
Uniform Delay, d1		
Progression Factor		
Incremental Delay, d2		
Delay (s)		
Level of Service		
Approach Delay (s)		
Approach LOS		
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
42: California Avenue & Oak Street

AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	*0.75	0.95	1.00	0.97	0.91	1.00	*0.75	0.91		1.00	0.91	0.91
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00		1.00	0.99	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.94	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	2654	3539	1560	3433	4988	1560	2629	4956		1770	3076	1406
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	2654	3539	1560	3433	4988	1560	2629	4956		1770	3076	1406
Volume (vph)	718	928	99	34	483	128	198	541	54	84	186	270
Peak-hour factor, PHF	0.92	0.92	0.92	0.70	0.70	0.70	0.76	0.76	0.76	0.86	0.86	0.86
Adj. Flow (vph)	780	1009	108	49	690	183	261	712	71	98	216	314
RTOR Reduction (vph)	0	0	52	0	0	36	0	0	0	0	0	0
Lane Group Flow (vph)	780	1009	56	49	690	147	261	783	0	98	371	159
Confl. Peds. (#/hr)			2			2			3			2
Heavy Vehicles (%)	2%	2%	2%	2%	4%	2%	3%	3%	4%	2%	6%	3%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	27.0	54.9	54.9	4.9	32.8	32.8	12.1	21.1		8.1	17.1	17.1
Effective Green, g (s)	27.6	55.8	55.8	5.5	33.7	33.7	12.7	22.0		8.7	18.0	18.0
Actuated g/C Ratio	0.26	0.52	0.52	0.05	0.31	0.31	0.12	0.20		0.08	0.17	0.17
Clearance Time (s)	4.6	4.9	4.9	4.6	4.9	4.9	4.6	4.9		4.6	4.9	4.9
Vehicle Extension (s)	1.5	2.0	2.0	1.0	2.0	2.0	1.0	2.0		0.5	2.0	2.0
Lane Grp Cap (vph)	678	1828	806	175	1556	487	309	1010		143	513	234
v/s Ratio Prot	c0.29	c0.29		0.01	c0.14		c0.10	c0.16		0.06	0.12	
v/s Ratio Perm			0.04			0.09						0.11
v/c Ratio	1.15	0.55	0.07	0.28	0.44	0.30	0.84	0.78		0.69	0.72	0.68
Uniform Delay, d1	40.2	17.6	13.1	49.3	29.7	28.2	46.7	40.7		48.3	42.6	42.3
Progression Factor	0.85	0.74	0.47	1.00	1.00	1.00	1.00	1.00		0.86	0.58	0.57
Incremental Delay, d2	72.7	0.3	0.0	0.3	0.9	1.6	17.9	3.4		8.6	3.5	5.0
Delay (s)	106.9	13.3	6.2	49.7	30.6	29.8	64.6	44.1		50.4	28.1	29.1
Level of Service	F	B	A	D	C	C	E	D		D	C	C
Approach Delay (s)		51.4			31.4			49.2			31.8	
Approach LOS		D			C			D			C	



















Intersection Summary

HCM Average Control Delay	44.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

46: California Avenue & Union Avenue

AM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0			4.0	4.0	
Lane Util. Factor		0.97	0.91			0.97	0.91			1.00	0.91	
Frpb, ped/bikes		1.00	0.99			1.00	0.99			1.00	1.00	
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00	1.00	
Frt		1.00	0.98			1.00	0.94			1.00	0.98	
Flt Protected		0.95	1.00			0.95	1.00			0.95	1.00	
Satd. Flow (prot)		3367	4797			3277	4617			1689	4859	
Flt Permitted		0.95	1.00			0.95	1.00			0.95	1.00	
Satd. Flow (perm)		3367	4797			3277	4617			1689	4859	
Volume (vph)	2	288	254	46	4	144	302	200	3	86	1226	143
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.63	0.63	0.63	0.63	0.86	0.86	0.86	0.86
Adj. Flow (vph)	2	324	285	52	6	229	479	317	3	100	1426	166
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	326	337	0	0	235	796	0	0	103	1592	0
Confl. Peds. (#/hr)				12				11				10
Heavy Vehicles (%)	2%	4%	4%	11%	2%	7%	4%	5%	2%	7%	5%	3%
Turn Type	Prot	Prot			Prot	Prot			Prot	Prot		
Protected Phases	7	7	4		3	3	8		5	5	2	
Permitted Phases												
Actuated Green, G (s)		14.1	26.3			11.5	23.7			9.1	31.1	
Effective Green, g (s)		15.3	26.7			12.7	24.1			8.8	31.5	
Actuated g/C Ratio		0.15	0.26			0.12	0.23			0.09	0.31	
Clearance Time (s)		5.2	4.4			5.2	4.4			3.7	4.4	
Vehicle Extension (s)		2.0	5.2			2.0	5.2			2.0	5.2	
Lane Grp Cap (vph)		502	1248			406	1085			145	1492	
v/s Ratio Prot		c0.10	c0.07			0.07	c0.17			0.06	c0.33	
v/s Ratio Perm												
v/c Ratio		0.65	0.27			0.58	0.90dr			0.71	1.07	
Uniform Delay, d1		41.1	30.2			42.4	36.3			45.7	35.5	
Progression Factor		1.00	1.00			1.00	1.00			1.00	1.00	
Incremental Delay, d2		2.2	0.3			1.2	3.2			12.8	43.5	
Delay (s)		43.3	30.5			43.7	39.5			58.4	79.0	
Level of Service		D	C			D	D			E	E	
Approach Delay (s)			36.8				40.5				77.8	
Approach LOS			D				D				E	

Intersection Summary

HCM Average Control Delay	50.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	102.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		
dr Defacto Right Lane. Recode with 1 though lane as a right lane.			
c Critical Lane Group			





















HCM Signalized Intersection Capacity Analysis
46: California Avenue & Union Avenue

AM Peak Hour
Existing Conditions

Movement	SBU	SBL	SBT	SBR
Lane Configurations		↘	↑↑↑	↗
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0
Lane Util. Factor		1.00	0.91	1.00
Frpb, ped/bikes		1.00	1.00	0.96
Flpb, ped/bikes		1.00	1.00	1.00
Frt		1.00	1.00	0.85
Flt Protected		0.95	1.00	1.00
Satd. Flow (prot)		1755	4893	1483
Flt Permitted		0.95	1.00	1.00
Satd. Flow (perm)		1755	4893	1483
Volume (vph)	25	150	828	177
Peak-hour factor, PHF	0.80	0.80	0.80	0.80
Adj. Flow (vph)	31	188	1035	221
RTOR Reduction (vph)	0	0	0	44
Lane Group Flow (vph)	0	219	1035	177
Confl. Peds. (#/hr)				15
Heavy Vehicles (%)	2%	3%	6%	5%
Turn Type	Prot	Prot		Perm
Protected Phases	1	1	6	
Permitted Phases				6
Actuated Green, G (s)		16.0	38.0	38.0
Effective Green, g (s)		15.7	38.4	38.4
Actuated g/C Ratio		0.15	0.37	0.37
Clearance Time (s)		3.7	4.4	4.4
Vehicle Extension (s)		2.0	5.2	5.2
Lane Grp Cap (vph)		269	1831	555
v/s Ratio Prot		0.12	0.21	
v/s Ratio Perm				0.12
v/c Ratio		0.81	0.57	0.32
Uniform Delay, d1		42.0	25.5	22.8
Progression Factor		1.00	1.00	1.00
Incremental Delay, d2		16.2	0.7	0.7
Delay (s)		58.2	26.2	23.5
Level of Service		E	C	C
Approach Delay (s)			30.5	
Approach LOS			C	
Intersection Summary				

HCM Signalized Intersection Capacity Analysis
47: Stockdale Highway & Real Road

AM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0		4.0	4.0			4.0
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95		0.95	0.95			1.00
Frpb, ped/bikes		1.00	1.00	0.98	1.00	1.00		1.00	1.00			0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00
Frt		1.00	1.00	0.85	1.00	1.00		1.00	0.98			0.96
Flt Protected		0.95	1.00	1.00	0.95	1.00		0.95	0.97			1.00
Satd. Flow (prot)		1731	3539	1498	1719	3379		1603	1630			1735
Flt Permitted		0.95	1.00	1.00	0.95	1.00		0.95	0.97			1.00
Satd. Flow (perm)		1731	3539	1498	1719	3379		1603	1630			1735
Volume (vph)	20	59	761	597	129	702	24	600	140	49	16	185
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.79	0.79	0.79	0.86	0.86	0.86	0.74	0.74
Adj. Flow (vph)	23	69	885	694	163	889	30	698	163	57	22	250
RTOR Reduction (vph)	0	0	0	141	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	92	885	553	163	919	0	451	467	0	0	379
Confl. Peds. (#/hr)				3			4	6		2	2	
Heavy Vehicles (%)	2%	5%	2%	6%	5%	6%	12%	7%	3%	8%	44%	2%
Turn Type	Prot	Prot		Perm	Prot			Split			Split	
Protected Phases	5	5	2		1	6		3	3		4	4
Permitted Phases				2								
Actuated Green, G (s)		12.8	31.2	31.2	12.8	31.2		25.0	25.0			22.0
Effective Green, g (s)		12.8	32.2	32.2	12.8	32.2		25.0	25.0			22.0
Actuated g/C Ratio		0.12	0.30	0.30	0.12	0.30		0.23	0.23			0.20
Clearance Time (s)		4.0	5.0	5.0	4.0	5.0		4.0	4.0			4.0
Vehicle Extension (s)		1.5	2.0	2.0	1.5	2.0		2.0	2.0			2.0
Lane Grp Cap (vph)		205	1055	447	204	1007		371	377			353
v/s Ratio Prot		0.05	0.25		c0.09	0.27		0.28	c0.29			c0.22
v/s Ratio Perm				c0.37								
v/c Ratio		0.45	0.84	1.24	0.80	0.91		1.22	1.24			1.07
Uniform Delay, d1		44.3	35.5	37.9	46.3	36.5		41.5	41.5			43.0
Progression Factor		1.00	1.00	1.00	0.70	0.56		1.00	1.00			1.00
Incremental Delay, d2		0.6	8.0	124.6	16.5	12.7		119.3	128.2			68.9
Delay (s)		44.9	43.5	162.5	49.1	33.0		160.8	169.7			111.9
Level of Service		D	D	F	D	C		F	F			F
Approach Delay (s)			93.0			35.4			165.3			111.9
Approach LOS			F			D			F			F
Intersection Summary												
HCM Average Control Delay			95.8				HCM Level of Service		F			
HCM Volume to Capacity ratio			1.14									
Actuated Cycle Length (s)			108.0				Sum of lost time (s)		16.0			
Intersection Capacity Utilization			80.8%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												

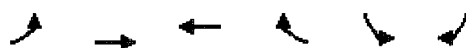
HCM Signalized Intersection Capacity Analysis
47: Stockdale Highway & Real Road

AM Peak Hour
Existing Conditions

Movement	SBR
Lane Configurations	
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Fr _t	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Volume (vph)	79
Peak-hour factor, PHF	0.74
Adj. Flow (vph)	107
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	6
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d ₁	
Progression Factor	
Incremental Delay, d ₂	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
48: Stockdale Highway & SR-99 SB Off-Ramp























AM Peak Hour
Existing Conditions



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3505	3406		1752	1538
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3505	3406		1752	1538
Volume (vph)	0	765	654	0	80	291
Peak-hour factor, PHF	0.86	0.86	0.83	0.83	0.88	0.88
Adj. Flow (vph)	0	890	788	0	91	331
RTOR Reduction (vph)	0	0	0	0	0	79
Lane Group Flow (vph)	0	890	788	0	91	252
Heavy Vehicles (%)	2%	3%	6%	2%	3%	5%
Turn Type					Perm	
Protected Phases		2	6		4	
Permitted Phases						4
Actuated Green, G (s)		75.6	75.6		23.2	23.2
Effective Green, g (s)		76.2	76.2		23.8	23.8
Actuated g/C Ratio		0.71	0.71		0.22	0.22
Clearance Time (s)		4.6	4.6		4.6	4.6
Vehicle Extension (s)		6.8	7.5		5.5	5.5
Lane Grp Cap (vph)		2473	2403		386	339
v/s Ratio Prot		c0.25	0.23		0.05	
v/s Ratio Perm						c0.16
v/c Ratio		0.36	0.33		0.24	0.74
Uniform Delay, d1		6.3	6.1		34.6	39.3
Progression Factor		0.05	1.09		1.00	1.00
Incremental Delay, d2		0.2	0.3		0.8	10.8
Delay (s)		0.5	6.9		35.4	50.0
Level of Service		A	A		D	D
Approach Delay (s)		0.5	6.9		46.9	
Approach LOS		A	A		D	
Intersection Summary						
HCM Average Control Delay		12.2		HCM Level of Service	B	
HCM Volume to Capacity ratio		0.45				
Actuated Cycle Length (s)		108.0		Sum of lost time (s)	8.0	
Intersection Capacity Utilization		42.8%		ICU Level of Service	A	
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
49: Stockdale Highway & Wible Road

AM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes		1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1770	3505	1545	1671	3319		1752	3505	1515	1752	3343
Flt Permitted		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1770	3505	1545	1671	3319		1752	3505	1515	1752	3343
Volume (vph)	2	129	434	280	77	318	55	188	393	147	37	153
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.87	0.87	0.87	0.76	0.76	0.76	0.82	0.82
Adj. Flow (vph)	2	152	511	329	89	366	63	247	517	193	45	187
RTOR Reduction (vph)	0	0	0	67	0	0	0	0	0	38	0	0
Lane Group Flow (vph)	0	154	511	262	89	429	0	247	517	155	45	187
Confl. Peds. (#/hr)				2			2			2		
Heavy Vehicles (%)	2%	2%	3%	3%	8%	6%	7%	3%	3%	5%	3%	8%
Turn Type	Prot	Prot		Perm	Prot			Prot		Perm	Prot	
Protected Phases	5	5	2		1	6		3	8		7	4
Permitted Phases				2						8		
Actuated Green, G (s)		26.8	50.1	50.1	8.1	31.4		19.6	27.3	27.3	4.5	12.2
Effective Green, g (s)		26.8	51.1	51.1	8.1	32.4		19.6	28.3	28.3	4.5	13.2
Actuated g/C Ratio		0.25	0.47	0.47	0.07	0.30		0.18	0.26	0.26	0.04	0.12
Clearance Time (s)		4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0	4.0	5.0
Vehicle Extension (s)		1.5	2.0	2.0	1.0	2.0		1.0	2.0	2.0	1.0	2.0
Lane Grp Cap (vph)		439	1658	731	125	996		318	918	397	73	409
v/s Ratio Prot		0.09	0.15		c0.05	c0.13		c0.14	0.15		0.03	0.06
v/s Ratio Perm				c0.17						0.10		
v/c Ratio		0.35	0.31	0.36	0.71	0.43		0.78	0.56	0.39	0.62	0.46
Uniform Delay, d1		33.4	17.5	18.0	48.8	30.4		42.1	34.5	32.8	50.9	44.1
Progression Factor		0.29	0.26	0.08	1.00	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.2	0.5	1.3	14.7	1.4		10.4	0.5	0.2	10.4	0.3
Delay (s)		9.9	5.0	2.7	63.5	31.7		52.5	35.0	33.0	61.3	44.4
Level of Service		A	A	A	E	C		D	C	C	E	D
Approach Delay (s)			5.0			37.2			39.1			52.4
Approach LOS			A			D			D			D

Intersection Summary

HCM Average Control Delay	28.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
49: Stockdale Highway & Wible Road

AM Peak Hour
Existing Conditions

Movement	SBR
Lane Configurations	7
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.0
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Volume (vph)	146
Peak-hour factor, PHF	0.82
Adj. Flow (vph)	178
RTOR Reduction (vph)	35
Lane Group Flow (vph)	143
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	3%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	12.2
Effective Green, g (s)	13.2
Actuated g/C Ratio	0.12
Clearance Time (s)	5.0
Vehicle Extension (s)	2.0
Lane Grp Cap (vph)	192
v/s Ratio Prot	
v/s Ratio Perm	c0.09
v/c Ratio	0.74
Uniform Delay, d1	45.8
Progression Factor	1.00
Incremental Delay, d2	12.8
Delay (s)	58.5
Level of Service	E
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis

50: SR-58 Ramps & Real Road

AM Peak Hour
Existing Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	LT	TH	TH	TH	LT	TH
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	1.00	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.90		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3273	1524	3068		3367	1810
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3273	1524	3068		3367	1810
Volume (vph)	303	641	148	343	793	118
Peak-hour factor, PHF	0.88	0.88	0.74	0.74	0.87	0.87
Adj. Flow (vph)	344	728	200	464	911	136
RTOR Reduction (vph)	0	124	0	0	0	0
Lane Group Flow (vph)	344	604	664	0	911	136
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	7%	6%	5%	4%	4%	5%
Turn Type	custom				Prot	
Protected Phases	3 1 3 4 8			2	1 4	6
Permitted Phases	3					
Actuated Green, G (s)	23.2	66.1	27.7		38.3	62.5
Effective Green, g (s)	23.8	66.7	29.3		38.9	64.1
Actuated g/C Ratio	0.23	0.64	0.28		0.37	0.62
Clearance Time (s)	4.6		5.6			5.6
Vehicle Extension (s)	2.0		3.5			3.5
Lane Grp Cap (vph)	749	977	864		1259	1116
v/s Ratio Prot	0.11	c0.40	c0.22		c0.27	0.08
v/s Ratio Perm						
v/c Ratio	0.46	0.62	1.04dr		0.72	0.12
Uniform Delay, d1	34.6	11.1	34.2		27.9	8.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.2	1.2	4.3		2.2	0.1
Delay (s)	34.7	12.3	38.5		30.1	8.3
Level of Service	C	B	D		C	A
Approach Delay (s)	19.5		38.5			27.3
Approach LOS	B		D			C

Intersection Summary


HCM Average Control Delay	27.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
51: Wible Road & SR-99 NB Ramps

AM Peak Hour
Existing Conditions

									
Movement	EBL	EBR	NBL	NBT	SBT	SBR	SBR2	SEL	SER
Lane Configurations	YY		Y	↑↑	↑↑				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0				
Lane Util. Factor	0.97		1.00	0.95	0.95				
Frt	1.00		1.00	1.00	0.92				
Flt Protected	0.95		0.95	1.00	1.00				
Satd. Flow (prot)	3368		1719	3406	3139				
Flt Permitted	0.95		0.95	1.00	1.00				
Satd. Flow (perm)	3368		1719	3406	3139				
Volume (vph)	250	7	220	478	240	0	270	0	0
Peak-hour factor, PHF	0.86	0.86	0.71	0.71	0.79	0.79	0.79	0.92	0.92
Adj. Flow (vph)	291	8	310	673	304	0	342	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	299	0	310	673	646	0	0	0	0
Heavy Vehicles (%)	4%	2%	5%	6%	8%	2%	4%	2%	2%
Turn Type			Prot						
Protected Phases	4		5	2	6				
Permitted Phases									
Actuated Green, G (s)	17.4		16.8	44.0	23.9				
Effective Green, g (s)	17.6		16.5	45.3	24.8				
Actuated g/C Ratio	0.25		0.23	0.64	0.35				
Clearance Time (s)	4.2		3.7	5.3	4.9				
Vehicle Extension (s)	8.0		2.0	4.9	5.7				
Lane Grp Cap (vph)	836		400	2176	1098				
v/s Ratio Prot	c0.09		c0.18	0.20	c0.21				
v/s Ratio Perm									
v/c Ratio	0.36		0.78	0.31	0.59				
Uniform Delay, d1	22.0		25.5	5.8	18.9				
Progression Factor	1.00		1.00	1.00	1.00				
Incremental Delay, d2	1.1		8.3	0.2	1.5				
Delay (s)	23.1		33.8	5.9	20.3				
Level of Service	C		C	A	C				
Approach Delay (s)	23.1			14.7	20.3			0.0	
Approach LOS	C			B	C			A	
Intersection Summary									
HCM Average Control Delay			17.9		HCM Level of Service			B	
HCM Volume to Capacity ratio			0.57						
Actuated Cycle Length (s)			70.9		Sum of lost time (s)			12.0	
Intersection Capacity Utilization			44.9%		ICU Level of Service			A	
Analysis Period (min)			15						
c Critical Lane Group									

AM Peak Hour
Existing Conditions

Synchro 6 Report
11/30/2010

AM Peak Hour Existing Conditions

Fehr & Peers Associates, Inc.

HCM Signalized Intersection Capacity Analysis
53: SR-58 WB On-Ramp & H Street

AM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations					↰	↱		↰	↱			↰
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0	4.0		4.0	4.0			4.0
Lane Util. Factor					1.00	1.00		1.00	0.95			0.95
Frpb, ped/bikes					1.00	0.99		1.00	1.00			0.99
Flpb, ped/bikes					1.00	1.00		1.00	1.00			1.00
Frt					1.00	0.85		1.00	1.00			0.95
Flt Protected					0.98	1.00		0.95	1.00			1.00
Satd. Flow (prot)					1776	1560		1770	3539			3265
Flt Permitted					0.98	1.00		0.45	1.00			1.00
Satd. Flow (perm)					1776	1560		836	3539			3265
Volume (vph)	0	0	0	100	107	90	2	94	890	0	0	298
Peak-hour factor, PHF	0.92	0.92	0.92	0.80	0.80	0.80	0.75	0.75	0.75	0.75	0.79	0.79
Adj. Flow (vph)	0	0	0	125	134	112	3	125	1187	0	0	377
RTOR Reduction (vph)	0	0	0	0	0	93	0	0	0	0	0	21
Lane Group Flow (vph)	0	0	0	0	259	19	0	128	1187	0	0	523
Confl. Peds. (#/hr)						2						
Heavy Vehicles (%)	2%	2%	2%	5%	4%	2%	2%	2%	2%	2%	2%	4%
Turn Type				Perm		Perm	Prot	Prot				
Protected Phases					8		5	5	7	1	7	2
Permitted Phases				8		8						6
Actuated Green, G (s)					13.6	13.6		35.0	58.2			14.1
Effective Green, g (s)					14.2	14.2		36.8	59.8			15.0
Actuated g/C Ratio					0.17	0.17		0.45	0.73			0.18
Clearance Time (s)					4.6	4.6						4.9
Vehicle Extension (s)					3.0	3.0						4.0
Lane Grp Cap (vph)					308	270		605	2581			597
v/s Ratio Prot								0.05	c0.34			c0.16
v/s Ratio Perm					0.15	0.01		0.04				
v/c Ratio					0.84	0.07		0.21	0.46			0.88
Uniform Delay, d1					32.8	28.4		13.4	4.5			32.6
Progression Factor					0.43	0.32		0.43	0.20			1.11
Incremental Delay, d2					16.0	0.1		0.0	0.0			14.6
Delay (s)					30.1	9.1		5.8	0.9			50.7
Level of Service					C	A		A	A			D
Approach Delay (s)		0.0			23.8				1.4			50.7
Approach LOS		A			C				A			D
Intersection Summary												
HCM Average Control Delay		17.1										
HCM Volume to Capacity ratio		0.61										
Actuated Cycle Length (s)		82.0										
Intersection Capacity Utilization		52.1%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
53: SR-58 WB On-Ramp & H Street

AM Peak Hour
Existing Conditions

Movement	SBR
Lane Configurations	
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Volume (vph)	132
Peak-hour factor, PHF	0.79
Adj. Flow (vph)	167
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Heavy Vehicles (%)	6%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	






















HCM Signalized Intersection Capacity Analysis
54: SR-58 EB Off-Ramp & H Street

AM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱						↕		↰	↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00						0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00						1.00		1.00	1.00	
Frt	1.00	0.96						0.98		1.00	1.00	
Flt Protected	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (prot)	1770	1736						3443		1770	3438	
Flt Permitted	0.95	1.00						1.00		0.95	1.00	
Satd. Flow (perm)	1770	1736						3443		1770	3438	
Volume (vph)	205	156	49	0	0	0	0	781	128	69	331	0
Peak-hour factor, PHF	0.74	0.74	0.74	0.92	0.92	0.92	0.75	0.75	0.75	0.88	0.88	0.88
Adj. Flow (vph)	277	211	66	0	0	0	0	1041	171	78	376	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	277	277	0	0	0	0	0	1212	0	78	376	0
Confl. Peds. (#/hr)			2						2			
Heavy Vehicles (%)	2%	4%	9%	2%	2%	2%	2%	2%	5%	2%	5%	2%
Turn Type	Perm						Prot					
Protected Phases		7						2		1 8	5 6 8	
Permitted Phases	7											
Actuated Green, G (s)	15.0	15.0						27.8		24.5	57.2	
Effective Green, g (s)	16.6	16.6						28.7		24.7	57.4	
Actuated g/C Ratio	0.20	0.20						0.35		0.30	0.70	
Clearance Time (s)	5.6	5.6						4.9				
Vehicle Extension (s)	3.0	3.0						4.0				
Lane Grp Cap (vph)	358	351						1205		533	2407	
v/s Ratio Prot		c0.16						c0.35		0.04	c0.11	
v/s Ratio Perm	0.16											
v/c Ratio	0.77	0.79						1.01		0.15	0.16	
Uniform Delay, d1	30.9	31.0						26.6		20.9	4.1	
Progression Factor	1.00	1.00						1.00		1.66	0.04	
Incremental Delay, d2	10.0	11.2						27.3		0.0	0.0	
Delay (s)	40.9	42.2						54.0		34.9	0.2	
Level of Service	D	D						D		C	A	
Approach Delay (s)		41.6			0.0			54.0			6.1	
Approach LOS		D			A			D			A	
Intersection Summary												
HCM Average Control Delay		41.1										
HCM Volume to Capacity ratio		0.66										
Actuated Cycle Length (s)		82.0										
Intersection Capacity Utilization		52.1%							12.0			
Analysis Period (min)		15										
c Critical Lane Group												
HCM Level of Service									D			
Sum of lost time (s)												
ICU Level of Service									A			

HCM Signalized Intersection Capacity Analysis
55: Brundage Lane & Chester Avenue

AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.91	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	3438	1488	1770	3133		1770	3468		1656	4654	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	3438	1488	1770	3133		1770	3468		1656	4654	
Volume (vph)	176	300	61	47	243	28	22	53	591	64	23	
Peak-hour factor, PHF	0.81	0.81	0.81	0.82	0.82	0.82	0.71	0.71	0.71	0.71	0.89	
Adj. Flow (vph)	217	370	75	57	296	34	31	75	832	90	26	
RTOR Reduction (vph)	0	0	56	0	0	0	0	0	0	0	0	
Lane Group Flow (vph)	217	370	19	57	330	0	0	106	922	0	26	
Confl. Peds. (#/hr)			2			2				5		
Heavy Vehicles (%)	3%	5%	7%	2%	14%	7%	2%	2%	2%	6%	9%	
Turn Type	Prot		Perm	Prot			Prot	Prot			Prot	
Protected Phases	7	4		3	8		5	5	2		1	
Permitted Phases			4								6	
Actuated Green, G (s)	12.6	20.8	20.8	4.4	12.6			8.3	38.4		2.6	
Effective Green, g (s)	12.1	21.2	21.2	3.9	13.0			7.8	38.8		2.1	
Actuated g/C Ratio	0.15	0.26	0.26	0.05	0.16			0.10	0.47		0.03	
Clearance Time (s)	3.5	4.4	4.4	3.5	4.4			3.5	4.4		3.5	
Vehicle Extension (s)	1.0	2.0	2.0	1.0	2.0			1.0	2.0		1.0	
Lane Grp Cap (vph)	259	889	385	84	497			168	1641		42	
v/s Ratio Prot	c0.12	0.11		0.03	c0.11			0.06	c0.27		c0.02	
v/s Ratio Perm			0.01									
v/c Ratio	0.84	0.42	0.05	0.68	0.66			0.63	0.56		0.62	
Uniform Delay, d1	34.0	25.3	22.8	38.4	32.4			35.7	15.5		39.6	
Progression Factor	0.51	0.46	0.21	1.00	1.00			0.96	0.86		1.00	
Incremental Delay, d2	16.9	0.1	0.0	15.7	2.6			5.2	1.3		17.6	
Delay (s)	34.3	11.7	4.8	54.2	35.0			39.5	14.7		57.1	
Level of Service	C	B	A	D	D			D	B		E	
Approach Delay (s)		18.4			37.9				17.2		18.8	
Approach LOS		B			D				B		B	
Intersection Summary												
HCM Average Control Delay		21.0				HCM Level of Service		C				
HCM Volume to Capacity ratio		0.63										
Actuated Cycle Length (s)		82.0				Sum of lost time (s)		16.0				
Intersection Capacity Utilization		54.7%				ICU Level of Service		A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
55: Brundage Lane & Chester Avenue

AM Peak Hour
Existing Conditions

Movement	SBR
Approach Configurations	
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Volume (vph)	87
Peak-hour factor, PHF	0.89
Adj. Flow (vph)	98
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	3
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
56: SR-58 WB Off-Ramp & Chester Avenue

AM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations					↔			↔	↔			↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0	4.0			4.0
Lane Util. Factor					0.95			1.00	0.95			0.95
Frpb, ped/bikes					0.99			1.00	1.00			1.00
Flpb, ped/bikes					1.00			1.00	1.00			1.00
Frt					0.93			1.00	1.00			1.00
Flt Protected					0.99			0.95	1.00			1.00
Satd. Flow (prot)					3213			1753	3505			3343
Flt Permitted					0.99			0.95	1.00			1.00
Satd. Flow (perm)					3213			1753	3505			3343
Volume (vph)	0	0	0	87	181	206	1	59	524	0	0	300
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.86	0.86	0.72	0.72	0.72	0.72	0.84	0.84
Adj. Flow (vph)	0	0	0	101	210	240	1	82	728	0	0	357
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	551	0	0	83	728	0	0	357
Confl. Peds. (#/hr)						2						
Heavy Vehicles (%)	2%	2%	2%	3%	4%	3%	2%	3%	3%	2%	2%	8%
Turn Type				Perm			Prot		Prot			
Protected Phases					3		4 5	4 5	1 2 4			6
Permitted Phases				3								
Actuated Green, G (s)					15.9			27.1	57.8			20.5
Effective Green, g (s)					16.5			28.1	57.5			21.4
Actuated g/C Ratio					0.20			0.34	0.70			0.26
Clearance Time (s)					4.6							4.9
Vehicle Extension (s)					3.0							4.0
Lane Grp Cap (vph)					647			601	2458			872
v/s Ratio Prot								0.05	c0.21			c0.11
v/s Ratio Perm					0.17							
v/c Ratio					0.85			0.14	0.30			0.41
Uniform Delay, d1					31.6			18.6	4.6			25.1
Progression Factor					1.00			1.20	0.01			0.68
Incremental Delay, d2					10.5			0.1	0.0			1.4
Delay (s)					42.1			22.4	0.0			18.4
Level of Service					D			C	A			B
Approach Delay (s)		0.0			42.1				2.3			16.7
Approach LOS		A			D				A			B
Intersection Summary												
HCM Average Control Delay			18.0			HCM Level of Service			B			
HCM Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			82.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			48.3%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
56: SR-58 WB Off-Ramp & Chester Avenue

AM Peak Hour
Existing Conditions

Movement	SBR
Lane Configurations	7
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1544
Flt Permitted	1.00
Satd. Flow (perm)	1544
Volume (vph)	57
Peak-hour factor, PHF	0.84
Adj. Flow (vph)	68
RTOR Reduction (vph)	50
Lane Group Flow (vph)	18
Confl. Peds. (#/hr)	10
Heavy Vehicles (%)	2%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	20.5
Effective Green, g (s)	21.4
Actuated g/C Ratio	0.26
Clearance Time (s)	4.9
Vehicle Extension (s)	4.0
Lane Grp Cap (vph)	403
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.04
Uniform Delay, d1	22.7
Progression Factor	0.32
Incremental Delay, d2	0.2
Delay (s)	7.4
Level of Service	A
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis

57: SR-58 EB On-Ramp & Chester Avenue

AM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations		↑	↑					↑↑	↑		↑	↑↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0					4.0	4.0		4.0	4.0
Lane Util. Factor		1.00	1.00					0.95	1.00		1.00	0.95
Frpb, ped/bikes		1.00	0.99					1.00	0.98		1.00	1.00
Flpb, ped/bikes		1.00	1.00					1.00	1.00		1.00	1.00
Frt		1.00	0.85					1.00	0.85		1.00	1.00
Flt Protected		0.98	1.00					1.00	1.00		0.95	1.00
Satd. Flow (prot)		1815	1560					3539	1501		1704	3438
Flt Permitted		0.98	1.00					1.00	1.00		0.95	1.00
Satd. Flow (perm)		1815	1560					3539	1501		1704	3438
Volume (vph)	94	193	66	0	0	0	0	488	156	2	126	260
Peak-hour factor, PHF	0.78	0.78	0.78	0.92	0.92	0.92	0.70	0.70	0.70	0.91	0.91	0.91
Adj. Flow (vph)	121	247	85	0	0	0	0	697	223	2	138	286
RTOR Reduction (vph)	0	0	68	0	0	0	0	0	45	0	0	0
Lane Group Flow (vph)	0	368	17	0	0	0	0	697	178	0	140	286
Confl. Peds. (#/hr)			2						2			
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%	2%	2%	5%	2%	6%	5%
Turn Type	Perm		Perm						Perm	Prot	Prot	
Protected Phases		4						2		1 3	1 3	3 5 6
Permitted Phases	4		4						2			
Actuated Green, G (s)		16.0	16.0					23.2	23.2		28.7	56.8
Effective Green, g (s)		16.6	16.6					24.1	24.1		29.3	57.4
Actuated g/C Ratio		0.20	0.20					0.29	0.29		0.36	0.70
Clearance Time (s)		4.6	4.6					4.9	4.9			
Vehicle Extension (s)		3.0	3.0					4.0	4.0			
Lane Grp Cap (vph)		367	316					1040	441		609	2407
v/s Ratio Prot								c0.20			c0.08	c0.08
v/s Ratio Perm		0.20	0.01						0.12			
v/c Ratio		1.00	0.05					0.67	0.40		0.23	0.12
Uniform Delay, d1		32.7	26.4					25.5	23.2		18.5	4.0
Progression Factor		0.66	0.47					1.00	1.00		0.96	0.48
Incremental Delay, d2		37.9	0.0					3.4	2.7		0.1	0.0
Delay (s)		59.5	12.4					28.9	25.9		17.7	2.0
Level of Service		E	B					C	C		B	A
Approach Delay (s)		50.7			0.0			28.2				7.1
Approach LOS		D			A			C				A
Intersection Summary												
HCM Average Control Delay		28.9										
HCM Volume to Capacity ratio		0.56										
Actuated Cycle Length (s)		82.0							12.0			
Intersection Capacity Utilization		48.3%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
57: SR-58 EB On-Ramp & Chester Avenue






















AM Peak Hour
Existing Conditions

Movement	SBR
Lane Configurations	
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frft	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Volume (vph)	0
Peak-hour factor, PHF	0.91
Adj. Flow (vph)	0
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

58: Brundage Lane & Union Avenue

AM Peak Hour
Existing Conditions

												
Movement	EBU	FBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95	1.00		1.00	0.91	
Frpb, ped/bikes		1.00	1.00	0.99		1.00	1.00	0.97		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	
Frt		1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.98	
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	
Satd. Flow (prot)		1736	3471	1371		1658	3312	1468		1712	4828	
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	
Satd. Flow (perm)		1736	3471	1371		1658	3312	1468		1712	4828	
Volume (vph)	1	101	110	70	6	270	218	287	13	78	1260	148
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.88	0.88	0.88	0.88	0.78	0.78	0.78	0.78
Adj. Flow (vph)	1	117	128	81	7	307	248	326	17	100	1615	190
RTOR Reduction (vph)	0	0	0	70	0	0	0	65	0	0	14	0
Lane Group Flow (vph)	0	118	128	11	0	314	248	261	0	117	1791	0
Confl. Peds. (#/hr)				2				11				2
Heavy Vehicles (%)	2%	4%	4%	16%	2%	9%	9%	7%	2%	6%	4%	19%
Turn Type	Prot	Prot		Perm	Prot	Prot		Perm	Prot	Prot		
Protected Phases	7	7	4		3	3	8		5	5	2	
Permitted Phases				4			8					
Actuated Green, G (s)		8.8	11.8	11.8		20.9	23.9	23.9		8.8	31.9	
Effective Green, g (s)		8.5	12.7	12.7		20.6	24.8	24.8		8.5	32.8	
Actuated g/C Ratio		0.09	0.14	0.14		0.23	0.28	0.28		0.09	0.36	
Clearance Time (s)		3.7	4.9	4.9		3.7	4.9	4.9		3.7	4.9	
Vehicle Extension (s)		2.0	5.4	5.4		2.0	5.3	5.3		2.0	4.5	
Lane Grp Cap (vph)		164	490	194		380	914	405		162	1761	
v/s Ratio Prot		0.07	0.04			c0.19	0.07			c0.07	c0.37	
v/s Ratio Perm				0.01				c0.18				
v/c Ratio		0.72	0.26	0.06		0.83	0.27	0.64		0.72	1.02	
Uniform Delay, d1		39.5	34.4	33.4		32.9	25.5	28.7		39.6	28.6	
Progression Factor		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		11.8	0.7	0.3		13.1	0.4	5.0		12.6	25.8	
Delay (s)		51.4	35.1	33.7		46.0	25.8	33.7		52.1	54.4	
Level of Service		D	D	C		D	C	C		D	D	
Approach Delay (s)			40.6				35.9				54.2	
Approach LOS			D				D				D	
Intersection Summary												
HCM Average Control Delay			42.1									
HCM Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			89.9									
Intersection Capacity Utilization			70.5%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
58: Brundage Lane & Union Avenue





















AM Peak Hour
Existing Conditions



Movement	SBU	SBL	SBT	SBR
Lane Configurations		LT	TTT	
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	
Lane Util. Factor		1.00	0.91	
Frbp, ped/bikes		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	
Frt		1.00	0.99	
Flt Protected		0.95	1.00	
Satd. Flow (prot)		1718	4707	
Flt Permitted		0.95	1.00	
Satd. Flow (perm)		1718	4707	
Volume (vph)	21	69	874	55
Peak-hour factor, PHF	0.90	0.90	0.90	0.90
Adj. Flow (vph)	23	77	971	61
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	100	1032	0
Confl. Peds. (#/hr)				2
Heavy Vehicles (%)	2%	6%	9%	11%
Turn Type	Prot	Prot		
Protected Phases	1	1	6	
Permitted Phases				
Actuated Green, G (s)		8.1	31.2	
Effective Green, g (s)		7.8	32.1	
Actuated g/C Ratio		0.09	0.36	
Clearance Time (s)		3.7	4.9	
Vehicle Extension (s)		2.0	5.2	
Lane Grp Cap (vph)		149	1681	
v/s Ratio Prot		0.06	0.22	
v/s Ratio Perm				
v/c Ratio		0.67	0.61	
Uniform Delay, d1		39.8	23.8	
Progression Factor		1.00	1.00	
Incremental Delay, d2		9.0	1.0	
Delay (s)		48.8	24.8	
Level of Service		D	C	
Approach Delay (s)			26.9	
Approach LOS			C	
Intersection Summary				

HCM Signalized Intersection Capacity Analysis
59: Brundage Lane & Liggett Street

AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00			0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.97			0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1623	3252	1263	1766	3244		1671	1718			1581	
Flt Permitted	0.51	1.00	1.00	0.59	1.00		0.95	1.00			1.00	
Satd. Flow (perm)	870	3252	1263	1105	3244		1671	1718			1581	
Volume (vph)	18	236	87	77	289	8	468	34	7	2	0	32
Peak-hour factor, PHF	0.93	0.93	0.93	0.88	0.88	0.88	0.88	0.88	0.88	0.76	0.76	0.76
Adj. Flow (vph)	19	254	94	88	328	9	532	39	8	3	0	42
RTOR Reduction (vph)	0	0	69	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	19	254	25	88	337	0	532	47	0	0	96	0
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		
Heavy Vehicles (%)	11%	11%	25%	2%	11%	2%	8%	6%	15%	2%	2%	3%
Turn Type	Perm		Perm	Perm			Split			Split		
Protected Phases		2			6		8	8		7	7	
Permitted Phases	2		2	6								
Actuated Green, G (s)	15.6	15.6	15.6	15.6	15.6		28.7	28.7			7.0	
Effective Green, g (s)	17.5	17.5	17.5	17.5	17.5		28.9	28.9			7.2	
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.27		0.44	0.44			0.11	
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9		4.2	4.2			4.2	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0			2.0	
Lane Grp Cap (vph)	232	868	337	295	865		736	757			174	
v/s Ratio Prot		0.08			c0.10		c0.32	0.03			c0.06	
v/s Ratio Perm	0.02		0.02	0.08								
v/c Ratio	0.08	0.29	0.07	0.30	0.39		0.72	0.06			0.55	
Uniform Delay, d1	18.0	19.1	18.0	19.2	19.7		15.1	10.6			27.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.3	0.1	0.8	0.4		3.8	0.0			2.1	
Delay (s)	18.2	19.4	18.1	19.9	20.1		18.8	10.6			29.8	
Level of Service	B	B	B	B	C		B	B			C	
Approach Delay (s)		19.0			20.0			18.2			29.8	
Approach LOS		B			C			B			C	

Intersection Summary

HCM Average Control Delay	19.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	65.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			


HCM Signalized Intersection Capacity Analysis
59: Brundage Lane & Liggett Street

AM Peak Hour
Existing Conditions

Movement	SBR2
Lane Configurations	
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Volume (vph)	39
Peak-hour factor, PHF	0.76
Adj. Flow (vph)	51
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Heavy Vehicles (%)	3%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	






















HCM Signalized Intersection Capacity Analysis
60: SR-58 EB Ramps & Union Avenue

AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←		→	←		→	←	↑↑↑		←	↑↑↑	→
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0					4.0			4.0	
Lane Util. Factor	1.00		1.00					0.91			0.91	
Frpb, ped/bikes	1.00		1.00					1.00			1.00	
Flpb, ped/bikes	1.00		1.00					1.00			1.00	
Frt	1.00		0.85					0.97			0.97	
Flt Protected	0.95		1.00					1.00			1.00	
Satd. Flow (prot)	1752		1482					4707			4580	
Flt Permitted	0.95		1.00					1.00			1.00	
Satd. Flow (perm)	1752		1482					4707			4580	
Volume (vph)	603	0	218	0	0	0	0	919	199	0	816	174
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.92	0.92	0.80	0.80	0.80	0.88	0.88	0.88
Adj. Flow (vph)	670	0	242	0	0	0	0	1149	249	0	927	198
RTOR Reduction (vph)	0	0	37	0	0	0	0	0	0	0	56	0
Lane Group Flow (vph)	670	0	205	0	0	0	0	1398	0	0	1069	0
Confl. Peds. (#/hr)												2
Heavy Vehicles (%)	3%	2%	9%	2%	2%	2%	2%	6%	13%	2%	10%	9%
Turn Type	Prot	custom										
Protected Phases	4							2			6	
Permitted Phases			4									
Actuated Green, G (s)	23.1		23.1					23.3			23.3	
Effective Green, g (s)	23.3		23.3					24.2			24.2	
Actuated g/C Ratio	0.42		0.42					0.44			0.44	
Clearance Time (s)	4.2		4.2					4.9			4.9	
Vehicle Extension (s)	3.0		3.0					4.0			4.0	
Lane Grp Cap (vph)	736		622					2052			1997	
v/s Ratio Prot	c0.38							c0.30			0.23	
v/s Ratio Perm			0.14									
v/c Ratio	0.91		0.33					0.68			0.54	
Uniform Delay, d1	15.1		10.8					12.6			11.5	
Progression Factor	1.00		1.00					1.00			1.00	
Incremental Delay, d2	15.4		0.3					1.0			0.4	
Delay (s)	30.5		11.2					13.6			11.9	
Level of Service	C		B					B			B	
Approach Delay (s)		25.4			0.0			13.6			11.9	
Approach LOS		C			A			B			B	
Intersection Summary												
HCM Average Control Delay			16.2				HCM Level of Service				B	
HCM Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			55.5				Sum of lost time (s)			8.0		
Intersection Capacity Utilization			62.3%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
61: Ming Avenue & New Stine Road

AM Peak Hour
Existing Conditions





















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91	1.00	0.97	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	5010		3433	4966		3433	5085	1560	3433	4757	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	5010		3433	4966		3433	5085	1560	3433	4757	
Volume (vph)	526	1507	149	115	851	142	299	1106	90	83	316	206
Peak-hour factor, PHF	0.81	0.81	0.81	0.80	0.80	0.80	0.77	0.77	0.77	0.82	0.82	0.82
Adj. Flow (vph)	649	1860	184	144	1064	178	388	1436	117	101	385	251
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	38	0	0	0
Lane Group Flow (vph)	649	2044	0	144	1242	0	388	1436	79	101	636	0
Confl. Peds. (#/hr)			2			2			2			2
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	17.7	41.7		7.7	31.7		12.9	33.4	33.4	6.6	27.1	
Effective Green, g (s)	17.7	43.0		7.7	33.0		12.9	34.7	34.7	6.6	28.4	
Actuated g/C Ratio	0.16	0.40		0.07	0.31		0.12	0.32	0.32	0.06	0.26	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3	5.3	4.0	5.3	
Vehicle Extension (s)	0.5	2.0		0.5	2.0		0.5	2.0	2.0	0.5	2.0	
Lane Grp Cap (vph)	563	1995		245	1517		410	1634	501	210	1251	
v/s Ratio Prot	0.19	c0.41		0.04	c0.25		0.11	c0.28		0.03	c0.13	
v/s Ratio Perm									0.05			
v/c Ratio	1.15	1.02		0.59	0.82		0.95	0.88	0.16	0.48	0.51	
Uniform Delay, d1	45.1	32.5		48.6	34.7		47.2	34.7	26.2	49.0	33.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	87.7	26.7		2.3	5.0		30.5	5.6	0.1	0.6	0.1	
Delay (s)	132.8	59.2		50.9	39.8		77.7	40.2	26.3	49.7	34.0	
Level of Service	F	E		D	D		E	D	C	D	C	
Approach Delay (s)		76.9			40.9			46.9			36.1	
Approach LOS		E			D			D			D	

Intersection Summary

HCM Average Control Delay	56.5	HCM Level of Service	E
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
62: Ming Avenue & Real Road

AM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	0.91			1.00	*0.80		0.95	0.95	1.00	0.95
Frpb, ped/bikes		1.00	1.00			1.00	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00			1.00	1.00		1.00	1.00	1.00	1.00
Frt		1.00	0.99			1.00	0.99		1.00	1.00	0.85	1.00
Flt Protected		0.95	1.00			0.95	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)		1736	5048			1724	4306		1618	1770	1553	1618
Flt Permitted		0.95	1.00			0.95	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)		1736	5048			1724	4306		1618	1770	1553	1618
Volume (vph)	2	97	1468	56	8	70	1050	40	70	107	134	96
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.88	0.88	0.88	0.88	0.86	0.86	0.86	0.85
Adj. Flow (vph)	2	121	1835	70	9	80	1193	45	81	124	156	113
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	31	0
Lane Group Flow (vph)	0	123	1905	0	0	89	1238	0	81	124	125	113
Confl. Peds. (#/hr)				11				5	8			
Heavy Vehicles (%)	2%	4%	2%	2%	2%	5%	5%	10%	6%	2%	4%	6%
Turn Type	Prot	Prot			Prot	Prot			Split		Perm	Split
Protected Phases	5	5	2		1	1	6		8	8		7
Permitted Phases											8	
Actuated Green, G (s)		9.5	57.1			7.9	55.5		13.3	13.3	13.3	10.6
Effective Green, g (s)		9.5	58.4			7.9	56.8		14.2	14.2	14.2	11.5
Actuated g/C Ratio		0.09	0.54			0.07	0.53		0.13	0.13	0.13	0.11
Clearance Time (s)		4.0	5.3			4.0	5.3		4.9	4.9	4.9	4.9
Vehicle Extension (s)		1.0	2.0			1.0	2.0		2.0	2.0	2.0	1.0
Lane Grp Cap (vph)		153	2730			126	2265		213	233	204	172
v/s Ratio Prot		0.07	c0.38			c0.05	0.29		0.05	0.07		0.07
v/s Ratio Perm											c0.08	
v/c Ratio		0.80	0.70			0.71	0.55		0.38	0.53	0.61	0.66
Uniform Delay, d1		48.3	18.3			48.9	17.0		42.9	43.8	44.3	46.4
Progression Factor		1.00	1.00			1.18	0.68		1.00	1.00	1.00	1.00
Incremental Delay, d2		24.2	1.5			12.8	0.9		0.4	1.2	3.8	6.7
Delay (s)		72.6	19.8			70.5	12.5		43.3	45.0	48.1	53.1
Level of Service		E	B			E	B		D	D	D	D
Approach Delay (s)			23.0				16.4			45.9		
Approach LOS			C				B			D		
Intersection Summary												
HCM Average Control Delay		25.4										
HCM Volume to Capacity ratio		0.68										
Actuated Cycle Length (s)		108.0										
Intersection Capacity Utilization		62.8%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
62: Ming Avenue & Real Road

AM Peak Hour
Existing Conditions

	↓	↙
Movement	SBT	SBR
Lane Configurations	↔	↗
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	4.0
Lane Util. Factor	0.95	1.00
Frbp, ped/bikes	1.00	0.97
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	1656	1515
Flt Permitted	1.00	1.00
Satd. Flow (perm)	1656	1515
Volume (vph)	99	100
Peak-hour factor, PHF	0.85	0.85
Adj. Flow (vph)	116	118
RTOR Reduction (vph)	0	24
Lane Group Flow (vph)	116	94
Confl. Peds. (#/hr)		8
Heavy Vehicles (%)	9%	3%
Turn Type	Perm	
Protected Phases	7	
Permitted Phases		7
Actuated Green, G (s)	10.6	10.6
Effective Green, g (s)	11.5	11.5
Actuated g/C Ratio	0.11	0.11
Clearance Time (s)	4.9	4.9
Vehicle Extension (s)	1.0	1.0
Lane Grp Cap (vph)	176	161
v/s Ratio Prot	0.07	
v/s Ratio Perm		0.06
v/c Ratio	0.66	0.58
Uniform Delay, d1	46.4	46.0
Progression Factor	1.00	1.00
Incremental Delay, d2	6.6	3.4
Delay (s)	53.0	49.4
Level of Service	D	D
Approach Delay (s)	51.8	
Approach LOS	D	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
63: Ming Avenue & SR-99 SB Ramps

AM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↑↑↑			↑	↑↑↑				↑		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1000	1000	1000	1000	1000
Total Lost time (s)		4.0			4.0	4.0				4.0		
Lane Util. Factor		0.91			1.00	0.91				1.00		
Frpb, ped/bikes		1.00			1.00	1.00				0.99		
Flpb, ped/bikes		1.00			1.00	1.00				1.00		
Frt		0.98			1.00	1.00				0.86		
Flt Protected		1.00			0.95	1.00				1.00		
Satd. Flow (prot)		4984			1688	4848				806		
Flt Permitted		1.00			0.95	1.00				1.00		
Satd. Flow (perm)		4984			1688	4848				806		
Volume (vph)	0	1546	185	1	60	592	0	0	0	279	0	0
Peak-hour factor, PHF	0.84	0.84	0.84	0.83	0.83	0.83	0.83	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	1840	220	1	72	713	0	0	0	317	0	0
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2055	0	0	73	713	0	0	0	317	0	0
Confl. Peds. (#/hr)			2							2		
Heavy Vehicles (%)	2%	2%	3%	2%	7%	7%	2%	2%	2%	6%	2%	2%
Turn Type				Prot	Prot					Free		
Protected Phases		2		1	1	6						
Permitted Phases										Free		
Actuated Green, G (s)		92.0			6.7	108.0				108.0		
Effective Green, g (s)		93.3			6.7	108.0				108.0		
Actuated g/C Ratio		0.86			0.06	1.00				1.00		
Clearance Time (s)		5.3			4.0	2.0						
Vehicle Extension (s)		2.0			1.0	4.0						
Lane Grp Cap (vph)		4306			105	4848				806		
v/s Ratio Prot		0.41			0.04	0.15						
v/s Ratio Perm										0.39		
v/c Ratio		0.48			0.70	0.15				0.39		
Uniform Delay, d1		1.7			49.6	0.0				0.0		
Progression Factor		0.96			1.14	1.00				1.00		
Incremental Delay, d2		0.3			14.3	0.1				1.4		
Delay (s)		1.9			70.9	0.1				1.4		
Level of Service		A			E	A				A		
Approach Delay (s)		1.9				6.6			1.4			5.1
Approach LOS		A				A			A			A
Intersection Summary												
HCM Average Control Delay			3.4				HCM Level of Service		A			
HCM Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			108.0				Sum of lost time (s)		0.0			
Intersection Capacity Utilization			45.7%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
63: Ming Avenue & SR-99 SB Ramps





















AM Peak Hour
Existing Conditions

Movement	SBR
Lane Configurations	7
Ideal Flow (vphpl)	1000
Total Lost time (s)	4.0
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.86
Flt Protected	1.00
Satd. Flow (prot)	848
Flt Permitted	1.00
Satd. Flow (perm)	848
Volume (vph)	532
Peak-hour factor, PHF	0.88
Adj. Flow (vph)	605
RTOR Reduction (vph)	0
Lane Group Flow (vph)	605
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	Free
Protected Phases	
Permitted Phases	Free
Actuated Green, G (s)	108.0
Effective Green, g (s)	108.0
Actuated g/C Ratio	1.00
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	848
v/s Ratio Prot	
v/s Ratio Perm	c0.71
v/c Ratio	0.71
Uniform Delay, d1	0.0
Progression Factor	1.00
Incremental Delay, d2	5.1
Delay (s)	5.1
Level of Service	A
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

64: Ming Avenue & Wible Road

AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0	4.0		4.0
Lane Util. Factor	1.00	*0.40			1.00	*0.85		0.97	*0.85	1.00		0.97
Frpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00	0.97		1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00		1.00	1.00	1.00		1.00
Frt	1.00	0.98			1.00	0.99		1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00			0.95	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)	1752	2902			1528	4547		2968	3019	1413		3129
Flt Permitted	0.95	1.00			0.95	1.00		0.95	1.00	1.00		0.95
Satd. Flow (perm)	1752	2902			1528	4547		2968	3019	1413		3129
Volume (vph)	153	1457	216	4	37	520	53	55	286	260	6	30
Peak-hour factor, PHF	0.89	0.89	0.89	0.85	0.85	0.85	0.85	0.83	0.83	0.83	0.78	0.78
Adj. Flow (vph)	172	1637	243	5	44	612	62	66	345	313	8	38
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	63	0	0
Lane Group Flow (vph)	172	1880	0	0	49	674	0	66	345	250	0	46
Confl. Peds. (#/hr)			2							14		
Heavy Vehicles (%)	3%	2%	6%	2%	20%	5%	6%	18%	7%	11%	2%	14%
Turn Type	Prot			Prot	Prot			Prot		Perm	Prot	Prot
Protected Phases	5	2		1	1	6		3	8		7	7
Permitted Phases										8		
Actuated Green, G (s)	18.6	59.2			4.7	45.3		11.0	21.8	21.8		3.7
Effective Green, g (s)	18.6	60.5			4.7	46.6		11.0	23.1	23.1		3.7
Actuated g/C Ratio	0.17	0.56			0.04	0.43		0.10	0.21	0.21		0.03
Clearance Time (s)	4.0	5.3			4.0	5.3		4.0	5.3	5.3		4.0
Vehicle Extension (s)	1.5	2.0			1.0	2.0		1.0	2.0	2.0		1.5
Lane Grp Cap (vph)	302	1626			66	1962		302	646	302		107
v/s Ratio Prot	0.10	c0.65			c0.03	0.15		0.02	0.11			0.01
v/s Ratio Perm										c0.18		
v/c Ratio	0.57	1.16			0.74	0.34		0.22	0.53	0.83		0.43
Uniform Delay, d1	41.0	23.8			51.1	20.5		44.6	37.7	40.6		51.1
Progression Factor	0.75	0.57			0.64	0.51		1.00	1.00	1.00		1.00
Incremental Delay, d2	1.3	77.1			25.1	0.4		0.1	0.4	16.1		1.0
Delay (s)	32.0	90.5			57.7	10.8		44.7	38.1	56.6		52.1
Level of Service	C	F			E	B		D	D	E		D
Approach Delay (s)		85.6				14.0			46.7			
Approach LOS		F				B			D			

Intersection Summary

HCM Average Control Delay	61.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			























HCM Signalized Intersection Capacity Analysis
64: Ming Avenue & Wible Road

AM Peak Hour
Existing Conditions

	↓	↙
Movement	SBT	SBR
Lane Configurations	↑↑	
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.94	
Flt Protected	1.00	
Satd. Flow (prot)	3105	
Flt Permitted	1.00	
Satd. Flow (perm)	3105	
Volume (vph)	126	78
Peak-hour factor, PHF	0.78	0.78
Adj. Flow (vph)	162	100
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	262	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	10%	9%
Turn Type		
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	14.5	
Effective Green, g (s)	15.8	
Actuated g/C Ratio	0.15	
Clearance Time (s)	5.3	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	454	
v/s Ratio Prot	c0.08	
v/s Ratio Perm		
v/c Ratio	0.58	
Uniform Delay, d1	43.0	
Progression Factor	1.00	
Incremental Delay, d2	1.1	
Delay (s)	44.1	
Level of Service	D	
Approach Delay (s)	45.3	
Approach LOS	D	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
65: Ming Avenue & SR-99 NB Ramps

AM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor		*0.80	*0.85	1.00		*0.80	*0.85	1.00	0.91	*0.80	1.00	0.91
Frpb, ped/bikes		1.00	1.00	0.99		1.00	1.00	0.99	1.00	1.00	0.99	1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95
Satd. Flow (prot)		2804	4571	1515		2831	4486	1515	1610	2868	1396	1579
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95
Satd. Flow (perm)		2804	4571	1515		2831	4486	1515	1610	2868	1396	1579
Volume (vph)	2	1065	644	40	3	5	400	170	8	30	7	74
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.79	0.79	0.79	0.79	0.70	0.70	0.70	0.88
Adj. Flow (vph)	2	1224	740	46	4	6	506	215	11	43	10	84
RTOR Reduction (vph)	0	0	0	15	0	0	0	43	0	0	10	0
Lane Group Flow (vph)	0	1226	740	31	0	10	506	172	11	43	0	42
Confl. Peds. (#/hr)				2				2			2	2
Heavy Vehicles (%)	2%	3%	6%	5%	2%	2%	8%	5%	2%	6%	14%	4%
Turn Type	Prot	Prot		Perm	Prot	Prot		Perm	Split		Perm	Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases				2			6				3	
Actuated Green, G (s)		56.2	71.5	71.5		1.2	16.5	16.5	4.6	4.6	4.6	13.4
Effective Green, g (s)		56.2	72.8	72.8		1.2	17.8	17.8	4.6	4.6	4.6	13.4
Actuated g/C Ratio		0.52	0.67	0.67		0.01	0.16	0.16	0.04	0.04	0.04	0.12
Clearance Time (s)		4.0	5.3	5.3		4.0	5.3	5.3	4.0	4.0	4.0	4.0
Vehicle Extension (s)		2.0	2.0	2.0		1.0	2.0	2.0	1.5	1.5	1.5	1.5
Lane Grp Cap (vph)		1459	3081	1021		31	739	250	69	122	59	196
v/s Ratio Prot		c0.44	0.16			0.00	0.11		0.01	c0.01		0.03
v/s Ratio Perm				0.02				c0.11			0.00	
v/c Ratio		0.84	0.24	0.03		0.32	0.68	0.69	0.16	0.35	0.01	0.21
Uniform Delay, d1		22.1	6.8	5.9		53.0	42.5	42.5	49.8	50.3	49.5	42.6
Progression Factor		0.63	0.82	0.82		0.75	0.91	0.88	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.4	0.0	0.0		2.1	4.9	13.8	0.4	0.6	0.0	0.2
Delay (s)		14.4	5.6	4.8		42.1	43.6	51.0	50.2	50.9	49.5	42.8
Level of Service		B	A	A		D	D	D	D	D	D	D
Approach Delay (s)			10.9				45.8			50.6		
Approach LOS			B				D			D		
Intersection Summary												
HCM Average Control Delay		26.7			HCM Level of Service				C			
HCM Volume to Capacity ratio		0.80										
Actuated Cycle Length (s)		108.0			Sum of lost time (s)				16.0			
Intersection Capacity Utilization		81.7%			ICU Level of Service				D			
Analysis Period (min)		15										
c Critical Lane Group												





















HCM Signalized Intersection Capacity Analysis
65: Ming Avenue & SR-99 NB Ramps

AM Peak Hour
Existing Conditions

	↓	↙
Movement	SBT	SBR
Lane Configurations	↔↑	↑
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	4.0
Lane Util. Factor	*0.80	1.00
Frbp, ped/bikes	1.00	1.00
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	0.97	1.00
Satd. Flow (prot)	2766	1538
Flt Permitted	0.97	1.00
Satd. Flow (perm)	2766	1538
Volume (vph)	19	204
Peak-hour factor, PHF	0.88	0.88
Adj. Flow (vph)	22	232
RTOR Reduction (vph)	0	56
Lane Group Flow (vph)	64	176
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	11%	5%
Turn Type		Perm
Protected Phases	4	
Permitted Phases		4
Actuated Green, G (s)	13.4	13.4
Effective Green, g (s)	13.4	13.4
Actuated g/C Ratio	0.12	0.12
Clearance Time (s)	4.0	4.0
Vehicle Extension (s)	1.5	1.5
Lane Grp Cap (vph)	343	191
v/s Ratio Prot	0.02	
v/s Ratio Perm		c0.11
v/c Ratio	0.19	0.92
Uniform Delay, d1	42.4	46.8
Progression Factor	1.00	1.00
Incremental Delay, d2	0.1	42.7
Delay (s)	42.5	89.5
Level of Service	D	F
Approach Delay (s)	74.8	
Approach LOS	E	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
66: Ming Avenue & Castro Lane

AM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0		4.0	4.0		4.0
Lane Util. Factor		1.00	0.91			1.00	0.91		0.95	0.95		0.95
Frpb, ped/bikes		1.00	1.00			1.00	1.00		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00			1.00	1.00		1.00	1.00		1.00
Frt		1.00	0.99			1.00	0.99		1.00	1.00		1.00
Flt Protected		0.95	1.00			0.95	1.00		0.95	0.97		0.95
Satd. Flow (prot)		1730	4773			1770	4743		1618	1691		1633
Flt Permitted		0.95	1.00			0.95	1.00		0.95	0.97		0.95
Satd. Flow (perm)		1730	4773			1770	4743		1618	1691		1633
Volume (vph)	12	45	639	32	3	9	605	32	18	6	0	39
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.88	0.88	0.88	0.88	0.46	0.46	0.46	0.68
Adj. Flow (vph)	15	55	779	39	3	10	688	36	39	13	0	57
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	70	818	0	0	13	724	0	25	27	0	57
Confl. Peds. (#/hr)				2				2			2	2
Heavy Vehicles (%)	2%	5%	8%	3%	2%	2%	8%	16%	6%	2%	2%	5%
Turn Type	Prot	Prot			Prot	Prot			Split		Perm	Split
Protected Phases	5	5	2		1	1	6		4	4		3
Permitted Phases											4	
Actuated Green, G (s)		6.5	68.1			3.1	64.7		6.8	6.8		12.7
Effective Green, g (s)		6.5	69.4			3.1	66.0		6.8	6.8		12.7
Actuated g/C Ratio		0.06	0.64			0.03	0.61		0.06	0.06		0.12
Clearance Time (s)		4.0	5.3			4.0	5.3		4.0	4.0		4.0
Vehicle Extension (s)		1.0	2.0			1.0	2.0		1.5	1.5		1.0
Lane Grp Cap (vph)		104	3067			51	2899		102	106		192
v/s Ratio Prot		c0.04	c0.17			0.01	c0.15		0.02	c0.02		0.03
v/s Ratio Perm												
v/c Ratio		0.67	0.27			0.25	0.25		0.25	0.25		0.30
Uniform Delay, d1		49.7	8.3			51.3	9.6		48.2	48.2		43.6
Progression Factor		1.07	0.73			1.00	1.00		1.00	1.00		1.00
Incremental Delay, d2		12.5	0.2			1.0	0.2		0.5	0.5		0.3
Delay (s)		65.9	6.3			52.3	9.8		48.6	48.7		43.9
Level of Service		E	A			D	A		D	D		D
Approach Delay (s)			11.0				10.6			48.6		
Approach LOS			B				B			D		
Intersection Summary												
HCM Average Control Delay			16.7				HCM Level of Service			B		
HCM Volume to Capacity ratio			0.35									
Actuated Cycle Length (s)			108.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			39.8%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
66: Ming Avenue & Castro Lane



















AM Peak Hour
Existing Conditions



Movement	SBT	SBR
Lane Configurations	↕↗	
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.86	
Flt Protected	1.00	
Satd. Flow (prot)	1481	
Flt Permitted	1.00	
Satd. Flow (perm)	1481	
Volume (vph)	6	85
Peak-hour factor, PHF	0.68	0.68
Adj. Flow (vph)	9	125
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	134	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	2%	5%
Turn Type		
Protected Phases	3	
Permitted Phases		
Actuated Green, G (s)	12.7	
Effective Green, g (s)	12.7	
Actuated g/C Ratio	0.12	
Clearance Time (s)	4.0	
Vehicle Extension (s)	1.0	
Lane Grp Cap (vph)	174	
v/s Ratio Prot	c0.09	
v/s Ratio Perm		
v/c Ratio	0.77	
Uniform Delay, d1	46.2	
Progression Factor	1.00	
Incremental Delay, d2	17.2	
Delay (s)	63.5	
Level of Service	E	
Approach Delay (s)	57.6	
Approach LOS	E	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
67: Ming Avenue & H Street

AM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0			4.0	4.0	
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00	0.95	
Frpb, ped/bikes		1.00	1.00			1.00	1.00			1.00	1.00	
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00	1.00	
Frt		1.00	0.99			1.00	0.99			1.00	0.98	
Flt Protected		0.95	1.00			0.95	1.00			0.95	1.00	
Satd. Flow (prot)		1770	3330			1736	3251			1712	3417	
Flt Permitted		0.95	1.00			0.95	1.00			0.95	1.00	
Satd. Flow (perm)		1770	3330			1736	3251			1712	3417	
Volume (vph)	5	144	511	35	1	96	344	21	7	45	580	87
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.82	0.82	0.82	0.82
Adj. Flow (vph)	6	171	608	42	1	114	410	25	9	55	707	106
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	177	650	0	0	115	435	0	0	64	813	0
Confl. Peds. (#/hr)				2				3				2
Heavy Vehicles (%)	2%	2%	7%	11%	2%	4%	10%	10%	2%	6%	3%	6%
Turn Type	Prot	Prot			Prot	Prot			Prot	Prot		
Protected Phases	7	7	4		3	3	8		5	5	2	
Permitted Phases												
Actuated Green, G (s)		10.3	17.8			7.3	14.8			4.6	34.2	
Effective Green, g (s)		10.3	19.1			7.3	16.1			4.6	35.5	
Actuated g/C Ratio		0.13	0.23			0.09	0.20			0.06	0.43	
Clearance Time (s)		4.0	5.3			4.0	5.3			4.0	5.3	
Vehicle Extension (s)		1.0	4.0			1.0	4.0			1.0	4.0	
Lane Grp Cap (vph)		222	776			155	638			96	1479	
v/s Ratio Prot		c0.10	c0.20			0.07	0.13			c0.04	c0.24	
v/s Ratio Perm												
v/c Ratio		0.80	0.84			0.74	0.68			0.67	0.55	
Uniform Delay, d1		34.8	30.0			36.4	30.6			37.9	17.3	
Progression Factor		1.00	1.00			1.00	1.00			1.00	1.00	
Incremental Delay, d2		16.7	8.2			15.3	3.3			12.7	1.5	
Delay (s)		51.5	38.2			51.8	33.8			50.7	18.8	
Level of Service		D	D			D	C			D	B	
Approach Delay (s)			41.0				37.6				21.1	
Approach LOS			D				D				C	
Intersection Summary												
HCM Average Control Delay			29.6				HCM Level of Service			C		
HCM Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			82.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			57.8%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												



















HCM Signalized Intersection Capacity Analysis
67: Ming Avenue & H Street

AM Peak Hour
Existing Conditions

Movement	SBU	SBL	SBT	SBR
Lane Configurations		←	↑↑	↑
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0
Lane Util. Factor		1.00	0.95	1.00
Frbp, ped/bikes		1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00
Frt		1.00	1.00	0.85
Flt Protected		0.95	1.00	1.00
Satd. Flow (prot)		1770	3471	1502
Flt Permitted		0.95	1.00	1.00
Satd. Flow (perm)		1770	3471	1502
Volume (vph)	1	39	315	86
Peak-hour factor, PHF	0.82	0.82	0.82	0.82
Adj. Flow (vph)	1	48	384	105
RTOR Reduction (vph)	0	0	0	60
Lane Group Flow (vph)	0	49	384	45
Confl. Peds. (#/hr)				2
Heavy Vehicles (%)	2%	2%	4%	6%
Turn Type	Prot	Prot		Perm
Protected Phases	1	1	6	
Permitted Phases				6
Actuated Green, G (s)		4.1	33.7	33.7
Effective Green, g (s)		4.1	35.0	35.0
Actuated g/C Ratio		0.05	0.43	0.43
Clearance Time (s)		4.0	5.3	5.3
Vehicle Extension (s)		1.0	4.0	4.0
Lane Grp Cap (vph)		89	1482	641
v/s Ratio Prot		0.03	0.11	
v/s Ratio Perm				0.03
v/c Ratio		0.55	0.26	0.07
Uniform Delay, d1		38.0	15.1	13.9
Progression Factor		1.00	1.00	1.00
Incremental Delay, d2		4.1	0.4	0.2
Delay (s)		42.2	15.6	14.1
Level of Service		D	B	B
Approach Delay (s)			17.7	
Approach LOS			B	
Intersection Summary				





HCM Signalized Intersection Capacity Analysis
68: Ming Avenue & Chester Avenue

AM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0			4.0	4.0	
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00	0.95	
Frpb, ped/bikes		1.00	1.00			1.00	1.00			1.00	1.00	
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00	1.00	
Frt		1.00	0.97			1.00	0.97			1.00	0.99	
Flt Protected		0.95	1.00			0.95	1.00			0.95	1.00	
Satd. Flow (prot)		1736	3236			1720	3135			1628	3366	
Flt Permitted		0.95	1.00			0.95	1.00			0.95	1.00	
Satd. Flow (perm)		1736	3236			1720	3135			1628	3366	
Volume (vph)	4	178	373	87	1	61	216	47	1	63	381	35
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	5	220	460	107	1	76	270	59	1	79	476	44
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	225	567	0	0	77	329	0	0	80	520	0
Confl. Peds. (#/hr)				2				5				4
Heavy Vehicles (%)	2%	4%	7%	13%	2%	5%	13%	6%	2%	11%	5%	14%
Turn Type	Prot	Prot			Prot	Prot			Prot	Prot		
Protected Phases	5	5	2		1	1	6		3	3	8	
Permitted Phases												
Actuated Green, G (s)		9.5	21.7			4.1	16.3			4.3	17.9	
Effective Green, g (s)		9.5	22.6			4.1	17.2			4.3	19.2	
Actuated g/C Ratio		0.15	0.35			0.06	0.27			0.07	0.30	
Clearance Time (s)		4.0	4.9			4.0	4.9			4.0	5.3	
Vehicle Extension (s)		1.0	2.0			1.0	2.0			1.0	2.0	
Lane Grp Cap (vph)		258	1145			110	844			110	1011	
v/s Ratio Prot		c0.13	c0.18			0.04	0.10			c0.05	c0.15	
v/s Ratio Perm												
v/c Ratio		0.87	0.50			0.70	0.39			0.73	0.51	
Uniform Delay, d1		26.6	16.2			29.3	19.1			29.2	18.5	
Progression Factor		1.00	1.00			1.00	1.00			1.00	1.00	
Incremental Delay, d2		25.3	0.1			14.5	0.1			18.2	0.2	
Delay (s)		51.9	16.3			43.8	19.2			47.5	18.7	
Level of Service		D	B			D	B			D	B	
Approach Delay (s)			26.4				23.9				22.5	
Approach LOS			C				C				C	
Intersection Summary												
HCM Average Control Delay			23.7				HCM Level of Service				C	
HCM Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			63.9				Sum of lost time (s)			8.0		
Intersection Capacity Utilization			52.4%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												





















HCM Signalized Intersection Capacity Analysis
68: Ming Avenue & Chester Avenue

AM Peak Hour
Existing Conditions

				
Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0
Lane Util. Factor		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00
Frt		1.00	1.00	0.85
Flt Protected		0.95	1.00	1.00
Satd. Flow (prot)		1738	3471	1475
Flt Permitted		0.95	1.00	1.00
Satd. Flow (perm)		1738	3471	1475
Volume (vph)	2	26	254	147
Peak-hour factor, PHF	0.81	0.81	0.81	0.81
Adj. Flow (vph)	2	32	314	181
RTOR Reduction (vph)	0	0	0	37
Lane Group Flow (vph)	0	34	314	144
Confl. Peds. (#/hr)				2
Heavy Vehicles (%)	2%	4%	4%	8%
Turn Type	Prot	Prot		Perm
Protected Phases	7	7	4	
Permitted Phases				4
Actuated Green, G (s)		2.0	15.6	15.6
Effective Green, g (s)		2.0	16.9	16.9
Actuated g/C Ratio		0.03	0.26	0.26
Clearance Time (s)		4.0	5.3	5.3
Vehicle Extension (s)		1.0	2.0	2.0
Lane Grp Cap (vph)		54	918	390
v/s Ratio Prot		0.02	0.09	
v/s Ratio Perm				0.10
v/c Ratio		0.63	0.34	0.37
Uniform Delay, d1		30.6	19.0	19.2
Progression Factor		1.00	1.00	1.00
Incremental Delay, d2		15.4	0.1	0.2
Delay (s)		45.9	19.1	19.4
Level of Service		D	B	B
Approach Delay (s)			20.9	
Approach LOS			C	
Intersection Summary				

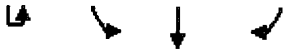
HCM Signalized Intersection Capacity Analysis
69: White Lane & Wible Road

AM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		0.97	*0.90			0.97	0.91	1.00		0.97	0.95	1.00
Frpb, ped/bikes		1.00	1.00			1.00	1.00	0.99		1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.99			1.00	1.00	0.85		1.00	1.00	0.85
Flt Protected		0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00
Satd. Flow (prot)		3368	4807			3400	4848	1561		2972	3505	1546
Flt Permitted		0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00
Satd. Flow (perm)		3368	4807			3400	4848	1561		2972	3505	1546
Volume (vph)	2	108	1556	88	3	323	1084	151	1	72	231	367
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.78	0.78	0.78	0.78	0.86	0.86	0.86	0.86
Adj. Flow (vph)	2	127	1831	104	4	414	1390	194	1	84	269	427
RTOR Reduction (vph)	0	0	0	0	0	0	0	38	0	0	0	85
Lane Group Flow (vph)	0	129	1935	0	0	418	1390	156	0	85	269	342
Confl. Peds. (#/hr)				2				2				2
Heavy Vehicles (%)	2%	4%	6%	2%	2%	3%	7%	2%	2%	18%	3%	3%
Turn Type	Prot	Prot			Prot	Prot		Perm	Prot	Prot		Perm
Protected Phases	5	5	2		1	1	6		3	3	8	
Permitted Phases								6				8
Actuated Green, G (s)		11.3	38.7			15.0	42.4	42.4		17.8	25.8	25.8
Effective Green, g (s)		11.3	40.4			15.0	44.1	44.1		17.8	27.1	27.1
Actuated g/C Ratio		0.10	0.37			0.14	0.41	0.41		0.16	0.25	0.25
Clearance Time (s)		4.0	5.7			4.0	5.7	5.7		4.0	5.3	5.3
Vehicle Extension (s)		1.0	2.0			1.0	2.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)		352	1798			472	1980	637		490	879	388
v/s Ratio Prot		0.04	c0.40			c0.12	0.29			0.03	0.08	
v/s Ratio Perm								0.10				c0.22
v/c Ratio		0.37	1.08			0.89	0.70	0.24		0.17	0.31	0.88
Uniform Delay, d1		45.0	33.8			45.7	26.5	21.0		38.8	32.8	38.9
Progression Factor		1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.2	45.1			17.3	2.1	0.9		0.1	0.1	19.8
Delay (s)		45.3	78.9			63.0	28.6	21.9		38.8	32.9	58.8
Level of Service		D	E			E	C	C		D	C	E
Approach Delay (s)			76.8				35.1				47.7	
Approach LOS			E				D				D	
Intersection Summary												
HCM Average Control Delay		54.7			HCM Level of Service					D		
HCM Volume to Capacity ratio		0.97										
Actuated Cycle Length (s)		108.0			Sum of lost time (s)					16.0		
Intersection Capacity Utilization		83.9%			ICU Level of Service					E		
Analysis Period (min)		15										
c Critical Lane Group												













HCM Signalized Intersection Capacity Analysis
69: White Lane & Wible Road

AM Peak Hour
Existing Conditions

				
Movement	SBU	SBL	SBT	SBR
Lane Configurations		LT	TT	RT
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0
Lane Util. Factor		0.97	0.95	1.00
Frpb, ped/bikes		1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00
Frt		1.00	1.00	0.85
Flt Protected		0.95	1.00	1.00
Satd. Flow (prot)		3260	3374	1487
Flt Permitted		0.95	1.00	1.00
Satd. Flow (perm)		3260	3374	1487
Volume (vph)	21	188	203	87
Peak-hour factor, PHF	0.83	0.83	0.83	0.83
Adj. Flow (vph)	25	227	245	105
RTOR Reduction (vph)	0	0	0	87
Lane Group Flow (vph)	0	252	245	18
Confl. Peds. (#/hr)				2
Heavy Vehicles (%)	2%	8%	7%	7%
Turn Type	Prot	Prot		Perm
Protected Phases	7	7	4	
Permitted Phases				4
Actuated Green, G (s)		9.5	17.5	17.5
Effective Green, g (s)		9.5	18.8	18.8
Actuated g/C Ratio		0.09	0.17	0.17
Clearance Time (s)		4.0	5.3	5.3
Vehicle Extension (s)		1.0	2.0	2.0
Lane Grp Cap (vph)		287	587	259
v/s Ratio Prot		0.08	0.07	
v/s Ratio Perm				0.01
v/c Ratio		0.88	0.42	0.07
Uniform Delay, d1		48.7	39.7	37.3
Progression Factor		1.00	1.00	1.00
Incremental Delay, d2		24.1	0.2	0.0
Delay (s)		72.7	39.9	37.3
Level of Service		E	D	D
Approach Delay (s)			53.2	
Approach LOS			D	
Intersection Summary				

HCM Signalized Intersection Capacity Analysis
70: White Lane & SR-99 SB Ramps


AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑		↑↑↑					↑↑		↑↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0					4.0		4.0
Lane Util. Factor		0.86	1.00		0.91					0.97		0.88
Frpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		0.97					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		6225	1509		4653					3433		2707
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		6225	1509		4653					3433		2707
Volume (vph)	0	1975	139	0	539	111	0	0	0	325	0	1022
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.92	0.92	0.92	0.86	0.86	0.86
Adj. Flow (vph)	0	2324	164	0	634	131	0	0	0	378	0	1188
RTOR Reduction (vph)	0	0	55	0	34	0	0	0	0	0	0	123
Lane Group Flow (vph)	0	2324	109	0	731	0	0	0	0	378	0	1065
Confl. Peds. (#/hr)						2						
Heavy Vehicles (%)	2%	5%	7%	2%	8%	9%	2%	2%	2%	2%	2%	5%
Turn Type		Perm								custom		custom
Protected Phases		2			6					4		
Permitted Phases			2							4		4
Actuated Green, G (s)		34.0	34.0		34.0					38.6		38.6
Effective Green, g (s)		36.3	36.3		36.3					40.2		40.2
Actuated g/C Ratio		0.43	0.43		0.43					0.48		0.48
Clearance Time (s)		6.3	6.3		6.3					5.6		5.6
Vehicle Extension (s)		4.3	4.3		4.9					3.4		3.4
Lane Grp Cap (vph)		2674	648		1999					1633		1288
v/s Ratio Prot		c0.37			0.16					0.11		
v/s Ratio Perm			0.07									c0.39
v/c Ratio		0.87	0.17		0.37					0.23		0.83
Uniform Delay, d1		21.9	14.8		16.3					13.0		19.1
Progression Factor		1.00	1.00		1.00					1.00		1.00
Incremental Delay, d2		3.5	0.2		0.2					0.1		4.6
Delay (s)		25.4	15.0		16.5					13.1		23.7
Level of Service		C	B		B					B		C
Approach Delay (s)		24.7			16.5			0.0			21.2	
Approach LOS		C			B			A			C	
Intersection Summary												
HCM Average Control Delay			22.3			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			84.5			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			55.7%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

71: White Lane & SR-99 NB Ramps




















AM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑		↑↑↑	↑	↑		↑			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0		4.0			
Lane Util. Factor		0.86	0.86		0.91	1.00	1.00		1.00			
Frpb, ped/bikes		1.00	1.00		1.00	0.98	1.00		1.00			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00			
Frt		0.92	0.85		1.00	0.85	1.00		0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (prot)		4224	1286		4848	1492	1703		1455			
Flt Permitted		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (perm)		4224	1286		4848	1492	1703		1455			
Volume (vph)	0	729	1571	0	541	684	109	0	93	0	0	0
Peak-hour factor, PHF	0.85	0.85	0.85	0.82	0.82	0.82	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	0	858	1848	0	660	834	125	0	107	0	0	0
RTOR Reduction (vph)	0	234	0	0	0	0	0	0	76	0	0	0
Lane Group Flow (vph)	0	1548	924	0	660	834	125	0	31	0	0	0
Confl. Peds. (#/hr)						2						
Heavy Vehicles (%)	2%	6%	8%	2%	7%	6%	6%	2%	11%	2%	2%	2%
Turn Type		Free				Free	Prot	custom				
Protected Phases		2			6		8					
Permitted Phases			Free			Free			8			
Actuated Green, G (s)		38.7	61.1		38.7	61.1	12.3		12.3			
Effective Green, g (s)		39.6	61.1		39.6	61.1	13.5		13.5			
Actuated g/C Ratio		0.65	1.00		0.65	1.00	0.22		0.22			
Clearance Time (s)		4.9			4.9		5.2		5.2			
Vehicle Extension (s)		5.7			5.7		5.3		5.3			
Lane Grp Cap (vph)		2738	1286		3142	1492	376		321			
v/s Ratio Prot		0.37			0.14		0.07					
v/s Ratio Perm			c0.72			0.56			0.02			
v/c Ratio		0.57	0.72		0.21	0.56	0.33		0.10			
Uniform Delay, d1		6.0	0.0		4.4	0.0	20.0		19.0			
Progression Factor		1.00	1.00		1.00	1.00	1.00		1.00			
Incremental Delay, d2		0.5	3.5		0.1	1.5	1.2		0.3			
Delay (s)		6.5	3.5		4.5	1.5	21.2		19.3			
Level of Service		A	A		A	A	C		B			
Approach Delay (s)		5.5			2.8			20.3			0.0	
Approach LOS		A			A			C			A	
Intersection Summary												
HCM Average Control Delay		5.4										
HCM Volume to Capacity ratio		0.72										
Actuated Cycle Length (s)		61.1										
Intersection Capacity Utilization		39.2%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis




72: White Lane & Hughes Lane

AM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0			4.0	4.0	4.0
Lane Util. Factor		1.00	0.91			1.00	0.91			1.00	0.95	1.00
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00	1.00	1.00
Frt		1.00	0.97			1.00	0.99			1.00	1.00	0.85
Flt Protected		0.95	1.00			0.95	1.00			0.95	1.00	1.00
Satd. Flow (prot)		1739	4718			1754	4778			1753	3471	1389
Flt Permitted		0.95	1.00			0.95	1.00			0.95	1.00	1.00
Satd. Flow (perm)		1739	4718			1754	4778			1753	3471	1389
Volume (vph)	14	129	683	165	4	30	682	47	5	291	183	28
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.76	0.76	0.76	0.76	0.88	0.88	0.88	0.88
Adj. Flow (vph)	18	161	854	206	5	39	897	62	6	331	208	32
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	22
Lane Group Flow (vph)	0	179	1060	0	0	44	959	0	0	337	208	10
Confl. Peds. (#/hr)				2				3				5
Heavy Vehicles (%)	2%	4%	7%	4%	2%	3%	7%	13%	2%	3%	4%	14%
Turn Type	Prot	Prot			Prot	Prot			Prot	Prot		Perm
Protected Phases	5	5	2		1	1	6		3	3	8	
Permitted Phases												8
Actuated Green, G (s)		17.3	45.2			4.5	32.4			23.0	32.9	32.9
Effective Green, g (s)		17.3	46.5			4.5	33.7			23.0	34.2	34.2
Actuated g/C Ratio		0.16	0.43			0.04	0.31			0.21	0.32	0.32
Clearance Time (s)		4.0	5.3			4.0	5.3			4.0	5.3	5.3
Vehicle Extension (s)		1.0	2.0			1.0	2.0			1.0	2.0	2.0
Lane Grp Cap (vph)		279	2031			73	1491			373	1099	440
v/s Ratio Prot		c0.10	0.22			0.03	c0.20			c0.19	0.06	
v/s Ratio Perm												0.01
v/c Ratio		0.64	0.52			0.60	0.64			0.90	0.19	0.02
Uniform Delay, d1		42.4	22.6			50.9	32.0			41.4	26.8	25.4
Progression Factor		1.00	1.00			1.00	1.00			1.00	1.00	1.00
Incremental Delay, d2		3.7	1.0			9.2	2.1			23.9	0.0	0.0
Delay (s)		46.2	23.5			60.1	34.1			65.3	26.9	25.4
Level of Service		D	C			E	C			E	C	C
Approach Delay (s)			26.8				35.3				49.2	
Approach LOS			C				D				D	
Intersection Summary												
HCM Average Control Delay		35.9				HCM Level of Service				D		
HCM Volume to Capacity ratio		0.71										
Actuated Cycle Length (s)		108.0				Sum of lost time (s)			16.0			
Intersection Capacity Utilization		64.8%				ICU Level of Service			C			
Analysis Period (min)		15										
c Critical Lane Group												























HCM Signalized Intersection Capacity Analysis
72: White Lane & Hughes Lane

AM Peak Hour
Existing Conditions

Movement	SBL	SBT	SBR
Lane Configurations			
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.0	4.0	
Lane Util. Factor	1.00	0.95	
Frpb, ped/bikes	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.91	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1736	3131	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1736	3131	
Volume (vph)	52	104	145
Peak-hour factor, PHF	0.75	0.75	0.75
Adj. Flow (vph)	69	139	193
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	69	332	0
Confl. Peds. (#/hr)			3
Heavy Vehicles (%)	4%	6%	3%
Turn Type	Prot		
Protected Phases	7	4	
Permitted Phases			
Actuated Green, G (s)	6.8	16.7	
Effective Green, g (s)	6.8	18.0	
Actuated g/C Ratio	0.06	0.17	
Clearance Time (s)	4.0	5.3	
Vehicle Extension (s)	1.0	2.0	
Lane Grp Cap (vph)	109	522	
v/s Ratio Prot	0.04	0.11	
v/s Ratio Perm			
v/c Ratio	0.63	0.64	
Uniform Delay, d1	49.4	41.9	
Progression Factor	1.00	1.00	
Incremental Delay, d2	8.5	1.9	
Delay (s)	57.9	43.8	
Level of Service	E	D	
Approach Delay (s)		46.2	
Approach LOS		D	
Intersection Summary			

HCM Signalized Intersection Capacity Analysis
1: State Road & Airport Drive

PM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	
Lane Util. Factor		1.00	1.00	0.97	0.95	0.95	1.00	0.91	1.00		0.91	
Frpb, ped/bikes		1.00	1.00	1.00	1.00	0.99	1.00	1.00	1.00		1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	
Flt Protected		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00		1.00	
Satd. Flow (prot)		1719	1538	3335	1719	1440	1719	4940	1538		4927	
Flt Permitted		0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00		1.00	
Satd. Flow (perm)		1719	1538	3335	1719	1440	1719	4940	1538		4927	
Volume (vph)	54	0	143	613	245	184	143	1079	61	0	1133	18
Peak-hour factor, PHF	0.58	0.58	0.58	0.75	0.75	0.75	0.94	0.94	0.94	0.99	0.99	0.99
Adj. Flow (vph)	93	0	247	817	327	245	152	1148	65	0	1144	18
RTOR Reduction (vph)	0	0	49	0	0	0	0	0	36	0	0	0
Lane Group Flow (vph)	0	93	198	817	327	245	152	1148	29	0	1162	0
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Split		Perm	Split		Perm	Prot		Perm			
Protected Phases	7	7		8	8		5	2			6	
Permitted Phases			7			8			2			
Actuated Green, G (s)		21.9	21.9	30.3	30.3	30.3	14.7	51.6	51.6		33.2	
Effective Green, g (s)		22.8	22.8	31.2	31.2	31.2	14.4	52.9	52.9		34.5	
Actuated g/C Ratio		0.19	0.19	0.26	0.26	0.26	0.12	0.44	0.44		0.29	
Clearance Time (s)		4.9	4.9	4.9	4.9	4.9	3.7	5.3	5.3		5.3	
Vehicle Extension (s)		8.0	8.0	4.7	4.7	4.7	2.0	3.9	3.9		4.1	
Lane Grp Cap (vph)		330	295	875	451	378	208	2198	684		1430	
v/s Ratio Prot		0.05		c0.24	0.19		c0.09	0.23			c0.24	
v/s Ratio Perm			c0.13			0.17			0.02			
v/c Ratio		0.28	0.67	0.93	0.73	0.65	0.73	0.52	0.04		0.81	
Uniform Delay, d1		41.1	44.6	42.8	39.9	39.0	50.4	23.9	18.7		39.2	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	
Incremental Delay, d2		2.0	11.5	17.0	6.7	4.9	10.8	0.3	0.0		3.9	
Delay (s)		43.1	56.1	59.8	46.6	43.8	61.2	24.1	18.7		43.1	
Level of Service		D	E	E	D	D	E	C	B		D	
Approach Delay (s)		52.5			53.9			28.0			43.1	
Approach LOS		D			D			C			D	
Intersection Summary												
HCM Average Control Delay			42.5				HCM Level of Service		D			
HCM Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			118.9				Sum of lost time (s)		16.0			
Intersection Capacity Utilization			66.3%				ICU Level of Service		C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
2: Buck Owens Boulevard & Airport Drive





















PM Peak Hour
Existing Conditions

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↗↘	↑↑↑↓	↗		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		
Lane Util. Factor		0.88	0.81	0.81		
Frt		0.85	1.00	0.85		
Flt Protected		1.00	1.00	1.00		
Satd. Flow (prot)		2632	5919	1258		
Flt Permitted		1.00	1.00	1.00		
Satd. Flow (perm)		2632	5919	1258		
Volume (vph)	0	780	1188	23	0	0
Peak-hour factor, PHF	0.73	0.73	0.88	0.88	0.93	0.93
Adj. Flow (vph)	0	1068	1350	26	0	0
RTOR Reduction (vph)	0	25	0	0	0	0
Lane Group Flow (vph)	0	1043	1350	26	0	0
Heavy Vehicles (%)	8%	8%	4%	4%	2%	2%
Turn Type	custom		Free			
Protected Phases	8		2			
Permitted Phases			Free			
Actuated Green, G (s)		32.8	34.3	77.4		
Effective Green, g (s)		33.7	35.7	77.4		
Actuated g/C Ratio		0.44	0.46	1.00		
Clearance Time (s)		4.9	5.4			
Vehicle Extension (s)		3.2	5.7			
Lane Grp Cap (vph)		1146	2730	1258		
v/s Ratio Prot		c0.40	c0.23			
v/s Ratio Perm				0.02		
v/c Ratio		0.91	0.49	0.02		
Uniform Delay, d1		20.4	14.6	0.0		
Progression Factor		1.00	1.00	1.00		
Incremental Delay, d2		10.8	0.4	0.0		
Delay (s)		31.3	14.9	0.0		
Level of Service		C	B	A		
Approach Delay (s)	31.3		14.6		0.0	
Approach LOS	C		B		A	
Intersection Summary						
HCM Average Control Delay		21.9		HCM Level of Service		C
HCM Volume to Capacity ratio		0.70				
Actuated Cycle Length (s)		77.4		Sum of lost time (s)		8.0
Intersection Capacity Utilization		51.3%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

3: Rio Mirada Drive & Buck Owens Boulevard

PM Peak Hour
Existing Conditions






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.89			0.92		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00			1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1616			1649		1719	3438	1502	1719	3438	
Flt Permitted		0.98			0.95		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1594			1579		1719	3438	1502	1719	3438	
Volume (vph)	9	49	206	27	106	180	108	577	14	16	14	0
Peak-hour factor, PHF	0.80	0.80	0.80	0.74	0.74	0.74	0.73	0.73	0.73	0.62	0.62	0.62
Adj. Flow (vph)	11	61	258	36	143	243	148	790	19	26	23	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	10	0	0	0
Lane Group Flow (vph)	0	330	0	0	422	0	148	790	9	26	23	0
Confl. Peds. (#/hr)	2					2			2			
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Turn Type	Perm			Perm			Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			
Actuated Green, G (s)		24.7			24.7		7.2	19.7	19.7	2.2	14.7	
Effective Green, g (s)		24.9			24.9		7.2	20.6	20.6	2.2	15.6	
Actuated g/C Ratio		0.42			0.42		0.12	0.35	0.35	0.04	0.26	
Clearance Time (s)		4.2			4.2		4.0	4.9	4.9	4.0	4.9	
Vehicle Extension (s)		1.5			1.5		1.0	2.0	2.0	1.5	2.0	
Lane Grp Cap (vph)		665			659		207	1186	518	63	898	
v/s Ratio Prot							c0.09	c0.23		0.02	0.01	
v/s Ratio Perm		0.21			c0.27				0.01			
v/c Ratio		0.50			0.64		0.71	0.67	0.02	0.41	0.03	
Uniform Delay, d1		12.8			13.8		25.3	16.6	12.9	28.1	16.4	
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2			1.6		9.4	1.1	0.0	1.6	0.0	
Delay (s)		13.0			15.4		34.6	17.7	12.9	29.7	16.4	
Level of Service		B			B		C	B	B	C	B	
Approach Delay (s)		13.0			15.4			20.2			23.5	
Approach LOS		B			B			C			C	

Intersection Summary

HCM Average Control Delay	17.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	59.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
4: Sillect Avenue & Buck Owens Boulevard

PM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00		0.95	0.91		0.95	0.97	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.92		1.00	0.96		0.85	1.00	0.96		1.00	0.97
Flt Protected	0.95	1.00		0.95	0.96		1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1626	1579		1633	1513		1440	3183	3288		1719	3316
Flt Permitted	0.95	1.00		0.95	0.96		1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1626	1579		1633	1513		1440	3183	3288		1719	3316
Volume (vph)	161	69	74	336	0	40	44	341	363	132	36	481
Peak-hour factor, PHF	0.88	0.88	0.88	0.91	0.91	0.91	0.91	0.92	0.92	0.92	0.79	0.79
Adj. Flow (vph)	183	78	84	369	0	44	48	371	395	143	46	609
RTOR Reduction (vph)	0	0	0	0	0	0	39	0	0	0	0	0
Lane Group Flow (vph)	183	162	0	227	186	0	9	371	538	0	46	733
Confl. Peds. (#/hr)				2			2			2		
Heavy Vehicles (%)	11%	11%	11%	5%	5%	10%	5%	10%	5%	5%	5%	5%
Turn Type	Split			Split			Perm	Prot			Prot	
Protected Phases	4	4		3	3			5	2		1	6
Permitted Phases							3					
Actuated Green, G (s)	18.4	18.4		21.0	21.0		21.0	16.4	47.2		4.7	34.0
Effective Green, g (s)	18.6	18.6		20.7	20.7		20.7	17.6	47.8		4.4	34.6
Actuated g/C Ratio	0.17	0.17		0.19	0.19		0.19	0.16	0.44		0.04	0.32
Clearance Time (s)	4.2	4.2		3.7	3.7		3.7	5.2	4.6		3.7	4.6
Vehicle Extension (s)	4.1	4.1		4.1	4.1		4.1	2.0	5.5		2.0	5.5
Lane Grp Cap (vph)	281	273		314	291		277	521	1462		70	1067
v/s Ratio Prot	c0.11	0.10		c0.14	0.12			c0.12	0.16		0.03	c0.22
v/s Ratio Perm							0.01					
v/c Ratio	0.65	0.59		0.72	0.64		0.03	0.71	0.37		0.66	0.69
Uniform Delay, d1	41.4	41.0		40.7	40.0		35.3	42.6	19.8		50.8	31.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	6.0	4.1		8.6	5.2		0.1	3.8	0.4		15.7	2.6
Delay (s)	47.4	45.1		49.3	45.2		35.3	46.4	20.2		66.5	34.3
Level of Service	D	D		D	D		D	D	C		E	C
Approach Delay (s)		46.3			46.2				30.9			36.2
Approach LOS		D			D				C			D

Intersection Summary

HCM Average Control Delay	37.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	107.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
4: Sillect Avenue & Buck Owens Boulevard

























PM Peak Hour
Existing Conditions



Movement	SBR2
Lane Configurations	
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Volume (vph)	98
Peak-hour factor, PHF	0.79
Adj. Flow (vph)	124
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Heavy Vehicles (%)	10%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	
























HCM Signalized Intersection Capacity Analysis
5: Rosedale Highway & Allen Road

PM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1710	1710	1710	1615	1615	1615	1900	1900	1900	1710	1710	1710
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1577	3008	1390	1447	2623	1251	1736	1810	1445	1477	3047	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1577	3008	1390	1447	2623	1251	1736	1810	1445	1477	3047	
Volume (vph)	134	668	70	375	450	237	91	416	169	181	405	31
Peak-hour factor, PHF	0.89	0.89	0.89	0.97	0.97	0.97	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	151	751	79	387	464	244	97	443	180	197	440	34
RTOR Reduction (vph)	0	0	32	0	0	72	0	0	54	0	0	0
Lane Group Flow (vph)	151	751	47	387	464	172	97	443	126	197	474	0
Confl. Peds. (#/hr)			2			2			2			2
Heavy Vehicles (%)	3%	8%	3%	6%	17%	7%	4%	5%	10%	10%	5%	10%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	16.8	34.8	34.8	25.0	43.0	43.0	11.4	30.1	30.1	20.7	39.4	
Effective Green, g (s)	17.0	37.8	37.8	25.2	46.0	46.0	11.6	33.1	33.1	20.9	42.4	
Actuated g/C Ratio	0.13	0.28	0.28	0.19	0.35	0.35	0.09	0.25	0.25	0.16	0.32	
Clearance Time (s)	4.2	7.0	7.0	4.2	7.0	7.0	4.2	7.0	7.0	4.2	7.0	
Vehicle Extension (s)	2.0	6.0	6.0	2.0	5.3	5.3	2.0	3.1	3.1	2.0	2.4	
Lane Grp Cap (vph)	202	855	395	274	907	433	151	450	360	232	971	
v/s Ratio Prot	0.10	c0.25		c0.27	0.18		0.06	c0.24		c0.13	0.16	
v/s Ratio Perm			0.03			0.14			0.09			
v/c Ratio	0.75	0.88	0.12	1.41	0.51	0.40	0.64	0.98	0.35	0.85	0.49	
Uniform Delay, d1	55.9	45.4	35.3	53.9	34.6	33.0	58.7	49.7	41.1	54.5	36.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.4	11.4	0.4	205.9	1.1	1.4	6.8	38.1	0.6	23.2	0.3	
Delay (s)	68.3	56.8	35.6	259.8	35.6	34.4	65.5	87.8	41.7	77.7	36.8	
Level of Service	E	E	D	F	D	C	E	F	D	E	D	
Approach Delay (s)		56.9			114.6			73.3			48.8	
Approach LOS		E			F			E			D	
Intersection Summary												
HCM Average Control Delay		76.9										
HCM Volume to Capacity ratio		1.02										
Actuated Cycle Length (s)		133.0										
Intersection Capacity Utilization		91.4%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
6: Rosedale Highway & Calloway Drive

PM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SET
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0		4.0	4.0
Lane Util. Factor		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		0.97	0.95
Frpb, ped/bikes		1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Frt		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)		1752	3167	1559	1736	3252	1515	1736	3325		3303	3438
Flt Permitted		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)		1752	3167	1559	1736	3252	1515	1736	3325		3303	3438
Volume (vph)	59	130	781	124	189	1226	155	157	643	161	232	671
Peak-hour factor, PHF	0.79	0.79	0.79	0.79	0.95	0.95	0.95	0.87	0.87	0.87	0.98	0.98
Adj. Flow (vph)	75	165	989	157	199	1291	163	180	739	185	237	685
RTOR Reduction (vph)	0	0	0	28	0	0	50	0	0	0	0	0
Lane Group Flow (vph)	0	240	989	129	199	1291	114	180	924	0	237	685
Confl. Peds. (#/hr)				2			2			2		
Heavy Vehicles (%)	3%	3%	14%	2%	4%	11%	5%	4%	5%	5%	6%	5%
Turn Type	Prot	Prot		Perm	Prot		Perm	Prot			Prot	
Protected Phases	5	5	2		1	6		3	8		7	4
Permitted Phases				2			6					
Actuated Green, G (s)		20.0	59.5	59.5	19.8	60.1	60.1	17.5	26.3		14.2	23.0
Effective Green, g (s)		19.4	62.4	62.4	20.0	63.0	63.0	16.9	29.0		13.6	24.7
Actuated g/C Ratio		0.14	0.45	0.45	0.14	0.45	0.45	0.12	0.21		0.10	0.18
Clearance Time (s)		3.4	6.9	6.9	4.2	6.9	6.9	3.4	5.7		3.4	5.7
Vehicle Extension (s)		2.0	5.9	5.9	2.0	6.5	6.5	2.0	4.3		2.0	4.3
Lane Grp Cap (vph)		243	1412	695	248	1463	682	210	689		321	607
v/s Ratio Prot		c0.14	0.31		0.11	c0.40		c0.10	c0.28		0.07	0.20
v/s Ratio Perm				0.08			0.07					
v/c Ratio		0.99	0.70	0.19	0.80	0.88	0.17	0.86	1.34		0.74	1.13
Uniform Delay, d1		60.2	31.3	23.5	58.1	35.1	22.9	60.4	55.5		61.5	57.6
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		53.6	2.9	0.6	16.0	8.0	0.5	26.6	163.1		7.4	77.3
Delay (s)		113.8	34.2	24.0	74.1	43.1	23.4	86.9	218.6		68.9	135.0
Level of Service		F	C	C	E	D	C	F	F		E	F
Approach Delay (s)			46.8			44.9			197.2			110.7
Approach LOS			D			D			F			F
Intersection Summary												
HCM Average Control Delay			91.0			HCM Level of Service			F			
HCM Volume to Capacity ratio			1.01									
Actuated Cycle Length (s)			140.0			Sum of lost time (s)			15.0			
Intersection Capacity Utilization			87.3%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
6: Rosedale Highway & Calloway Drive

PM Peak Hour
Existing Conditions

Movement	SBR
Lane Configurations	7
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1530
Flt Permitted	1.00
Satd. Flow (perm)	1530
Volume (vph)	110
Peak-hour factor, PHF	0.98
Adj. Flow (vph)	112
RTOR Reduction (vph)	34
Lane Group Flow (vph)	78
Confl. Peds. (#/hr)	2
Heavy Vehicles (%)	4%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	23.0
Effective Green, g (s)	24.7
Actuated g/C Ratio	0.18
Clearance Time (s)	5.7
Vehicle Extension (s)	4.3
Lane Grp Cap (vph)	270
v/s Ratio Prot	
v/s Ratio Perm	0.05
v/c Ratio	0.29
Uniform Delay, d1	50.0
Progression Factor	1.00
Incremental Delay, d2	0.9
Delay (s)	51.0
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
7: Rosedale Highway & Coffee Road

PM Peak Hour
Existing Conditions

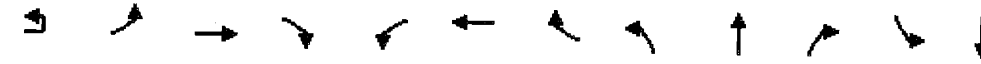
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↱↱		↰↱	↱↱	↱	↰↱	↱↱	↱	↰↱	↱↱	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	*0.90	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3335	3104		3367	3282	1530	3094	4940	1515	3303	4940	1514
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3335	3104		3367	3282	1530	3094	4940	1515	3303	4940	1514
Volume (vph)	162	908	267	419	1345	218	346	1078	171	193	743	130
Peak-hour factor, PHF	0.97	0.97	0.97	0.90	0.90	0.90	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	167	936	275	466	1494	242	389	1211	192	208	799	140
RTOR Reduction (vph)	0	0	0	0	0	47	0	0	57	0	0	42
Lane Group Flow (vph)	167	1211	0	466	1494	195	389	1211	135	208	799	98
Confl. Peds. (#/hr)			2			2			2			2
Heavy Vehicles (%)	5%	14%	5%	4%	10%	4%	5%	5%	5%	6%	5%	5%
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	8.0	52.9		16.0	60.9	60.9	20.5	33.6	33.6	12.9	26.0	26.0
Effective Green, g (s)	9.2	55.9		17.2	63.9	63.9	21.7	36.8	36.8	14.1	29.2	29.2
Actuated g/C Ratio	0.07	0.40		0.12	0.46	0.46	0.15	0.26	0.26	0.10	0.21	0.21
Clearance Time (s)	5.2	7.0		5.2	7.0	7.0	5.2	7.2	7.2	5.2	7.2	7.2
Vehicle Extension (s)	2.0	4.6		2.0	4.9	4.9	2.0	6.0	6.0	2.0	6.0	6.0
Lane Grp Cap (vph)	219	1239		414	1498	698	480	1299	398	333	1030	316
v/s Ratio Prot	0.05	0.39		c0.14	c0.46		0.13	c0.25		0.06	c0.16	
v/s Ratio Perm						0.13			0.09			0.06
v/c Ratio	0.76	0.98		1.13	1.00	0.28	0.81	0.93	0.34	0.62	0.78	0.31
Uniform Delay, d1	64.3	41.4		61.4	38.0	23.7	57.2	50.4	41.7	60.4	52.3	46.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.2	20.7		83.0	22.6	1.0	9.5	12.9	1.4	2.6	4.7	1.6
Delay (s)	77.5	62.1		144.4	60.6	24.7	66.7	63.2	43.2	63.0	57.0	48.5
Level of Service	E	E		F	E	C	E	E	D	E	E	D
Approach Delay (s)		64.0			74.4			61.8			57.1	
Approach LOS		E			E			E			E	

Intersection Summary

HCM Average Control Delay	65.7	HCM Level of Service	E
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis 8: Rosedale Highway & Mohawk Street

PM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↔	↕		↕	↕			↕			↕
Sign Control			Free			Free			Stop			Stop
Grade			0%			0%			0%			0%
Volume (veh/h)	49	0	1710	18	42	2042	0	8	0	85	0	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.89	0.89	0.89	0.76	0.76	0.76	0.25	0.25
Hourly flow rate (vph)	0	0	1819	19	47	2294	0	11	0	112	0	0
Pedestrians									2			2
Lane Width (ft)									12.0			12.0
Walking Speed (ft/s)									4.0			4.0
Percent Blockage									0			0
Right turn flare (veh)												
Median type									Raised			Raised
Median storage veh									1			1
Upstream signal (ft)												
pX, platoon unblocked	0.00											
vC, conflicting volume	0	2296			1821			3072	4221	921	3412	4212
vC1, stage 1 conf vol								1831	1831		2391	2391
vC2, stage 2 conf vol								1242	2391		1021	1821
vCu, unblocked vol	0	2296			1821			3072	4221	921	3412	4212
tC, single (s)	0.0	4.5			4.2			*7.6	6.5	7.0	7.5	6.5
tC, 2 stage (s)								6.6	5.5		6.5	5.5
tF (s)	0.0	2.4			2.2			3.9	4.0	3.3	3.5	4.0
p0 queue free %	0	100			85			77	100	58	100	100
cM capacity (veh/h)	0	171			320			47	36	266	21	31
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1				
Volume Total	0	1213	626	47	1530	765	122	0				
Volume Left	0	0	0	47	0	0	11	0				
Volume Right	0	0	19	0	0	0	112	0				
cSH	1700	1700	1700	320	1700	1700	190	1700				
Volume to Capacity	0.00	0.71	0.37	0.15	0.90	0.45	0.65	0.00				
Queue Length 95th (ft)	0	0	0	13	0	0	94	0				
Control Delay (s)	0.0	0.0	0.0	18.2	0.0	0.0	53.2	0.0				
Lane LOS				C			F	A				
Approach Delay (s)	0.0			0.4			53.2	0.0				
Approach LOS							F	A				

Intersection Summary

Average Delay	1.7		
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		

* User Entered Value























HCM Unsignalized Intersection Capacity Analysis
8: Rosedale Highway & Mohawk Street

PM Peak Hour
Existing Conditions

Movement	SBR
Lane Configurations	
Sign Control	
Grade	
Volume (veh/h)	0
Peak Hour Factor	0.25
Hourly flow rate (vph)	0
Pedestrians	
Lane Width (ft)	
Walking Speed (ft/s)	
Percent Blockage	
Right turn flare (veh)	
Median type	
Median storage veh	
Upstream signal (ft)	
pX, platoon unblocked	
vC, conflicting volume	1149
vC1, stage 1 conf vol	
vC2, stage 2 conf vol	
vCu, unblocked vol	1149
tC, single (s)	6.9
tC, 2 stage (s)	
tF (s)	3.3
p0 queue free %	100
cM capacity (veh/h)	192
Direction, Lane #	

HCM Signalized Intersection Capacity Analysis
9: Rosedale Highway & Camino del Rio Court

PM Peak Hour
Existing Conditions

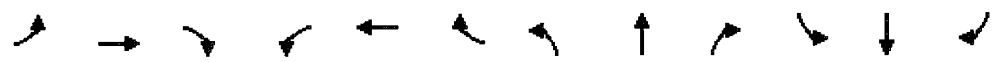
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		0.97	*0.87	1.00	1.00	1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.86		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00
Satd. Flow (prot)	1626	4836		3400	4678	1544	1626	1585		1665	1665	1408
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.95	1.00
Satd. Flow (perm)	1626	4836		3400	4678	1544	1626	1585		1665	1665	1408
Volume (vph)	56	1832	26	298	1833	440	18	8	133	342	0	68
Peak-hour factor, PHF	0.86	0.86	0.86	0.89	0.89	0.89	0.75	0.75	0.75	0.91	0.91	0.91
Adj. Flow (vph)	65	2130	30	335	2060	494	24	11	177	376	0	75
RTOR Reduction (vph)	0	0	0	0	0	150	0	0	0	0	0	31
Lane Group Flow (vph)	65	2160	0	335	2060	344	24	188	0	188	188	44
Confl. Peds. (#/hr)			2			2						2
Heavy Vehicles (%)	11%	7%	8%	3%	6%	3%	11%	2%	3%	3%	2%	13%
Turn Type	Prot			Prot		Perm	Split			Split		Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases						6						4
Actuated Green, G (s)	8.0	75.0		14.0	81.0	81.0	14.0	14.0		18.1	18.1	18.1
Effective Green, g (s)	8.2	77.3		14.2	83.3	83.3	14.2	14.2		18.3	18.3	18.3
Actuated g/C Ratio	0.06	0.55		0.10	0.59	0.59	0.10	0.10		0.13	0.13	0.13
Clearance Time (s)	4.2	6.3		4.2	6.3	6.3	4.2	4.2		4.2	4.2	4.2
Vehicle Extension (s)	2.0	6.4		2.0	5.5	5.5	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	95	2670		345	2783	919	165	161		218	218	184
v/s Ratio Prot	0.04	c0.45		c0.10	0.44		0.01	c0.12		c0.11	0.11	
v/s Ratio Perm						0.22						0.03
v/c Ratio	0.68	0.81		0.97	0.74	0.37	0.15	1.17		0.86	0.86	0.24
Uniform Delay, d1	64.6	25.4		62.7	20.5	14.8	57.4	62.9		59.6	59.6	54.6
Progression Factor	1.00	1.00		0.86	0.94	0.81	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.0	2.8		26.7	0.9	0.6	0.1	123.2		27.0	27.0	0.2
Delay (s)	79.6	28.1		80.8	20.1	12.5	57.5	186.1		86.6	86.6	54.8
Level of Service	E	C		F	C	B	E	F		F	F	D
Approach Delay (s)		29.6			25.9			171.5			81.3	
Approach LOS		C			C			F			F	

Intersection Summary

HCM Average Control Delay	37.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			





















HCM Signalized Intersection Capacity Analysis
10: Rosedale Highway & SR-99 SB Ramps

PM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑		↑↑↑	↑				↑	↑	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0				4.0	4.0	
Lane Util. Factor		0.86	0.86		0.91	1.00				0.95	0.95	
Frpb, ped/bikes		1.00	0.99		1.00	0.98				1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00	1.00				1.00	1.00	
Frt		0.95	0.85		1.00	0.85				1.00	0.85	
Flt Protected		1.00	1.00		1.00	1.00				0.95	1.00	
Satd. Flow (prot)		4404	1282		4940	1492				1491	1447	
Flt Permitted		1.00	1.00		1.00	1.00				0.95	1.00	
Satd. Flow (perm)		4404	1282		4940	1492				1491	1447	
Volume (vph)	0	1116	1191	0	2157	1267	0	0	0	219	0	414
Peak-hour factor, PHF	0.93	0.93	0.93	0.90	0.90	0.90	0.25	0.25	0.25	0.86	0.86	0.86
Adj. Flow (vph)	0	1200	1281	0	2397	1408	0	0	0	255	0	481
RTOR Reduction (vph)	0	69	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1771	641	0	2397	1408	0	0	0	255	481	0
Confl. Peds. (#/hr)			2			2						
Heavy Vehicles (%)	2%	4%	7%	2%	5%	6%	2%	2%	2%	15%	2%	6%
Turn Type			Free			Free				Split		
Protected Phases		2			6					4	4	
Permitted Phases			Free			Free						
Actuated Green, G (s)		108.5	140.0		108.5	140.0				23.0	23.0	
Effective Green, g (s)		108.9	140.0		108.9	140.0				23.1	23.1	
Actuated g/C Ratio		0.78	1.00		0.78	1.00				0.17	0.17	
Clearance Time (s)		4.4			4.4					4.1	4.1	
Vehicle Extension (s)		4.5			4.5					4.1	4.1	
Lane Grp Cap (vph)		3426	1282		3843	1492				246	239	
v/s Ratio Prot		0.40			0.49					0.17	c0.33	
v/s Ratio Perm			0.50			c0.94						
v/c Ratio		0.52	0.50		0.62	0.94				1.04	2.01	
Uniform Delay, d1		5.8	0.0		6.7	0.0				58.5	58.5	
Progression Factor		0.61	1.00		1.02	1.00				1.00	1.00	
Incremental Delay, d2		0.3	0.7		0.1	1.7				67.2	470.2	
Delay (s)		3.8	0.7		6.9	1.7				125.7	528.6	
Level of Service		A	A		A	A				F	F	
Approach Delay (s)		3.0			5.0			0.0			389.0	
Approach LOS		A			A			A			F	
Intersection Summary												
HCM Average Control Delay		44.5			HCM Level of Service			D				
HCM Volume to Capacity ratio		1.13										
Actuated Cycle Length (s)		140.0			Sum of lost time (s)			4.0				
Intersection Capacity Utilization		67.1%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
11: Rosedale Highway & Buck Owens Boulevard

PM Peak Hour
Existing Conditions























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0		4.0	4.0		4.0
Lane Util. Factor	*0.90	*0.85			0.91	1.00	0.97		1.00	0.97		1.00
Frt	1.00	1.00			1.00	0.85	1.00		0.85	1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95		1.00	0.95		1.00
Satd. Flow (prot)	2927	4704			5036	1538	3213		1568	3400		1509
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00	0.95		1.00
Satd. Flow (perm)	2927	4704			5036	1538	3213		1568	3400		1509
Volume (vph)	435	900	0	0	1828	501	1043	0	717	428	0	553
Peak-hour factor, PHF	0.84	0.84	0.84	0.86	0.86	0.86	0.86	0.86	0.86	0.84	0.84	0.84
Adj. Flow (vph)	518	1071	0	0	2126	583	1213	0	834	510	0	658
RTOR Reduction (vph)	0	0	0	0	0	2	0	0	0	0	0	1
Lane Group Flow (vph)	518	1071	0	0	2126	581	1213	0	834	510	0	657
Heavy Vehicles (%)	11%	3%	2%	2%	3%	5%	9%	2%	3%	3%	2%	7%
Turn Type	Prot				pm+ov		Prot		Free	Prot		custom
Protected Phases	5	2			6	4	8			4		5 7
Permitted Phases						6			Free			
Actuated Green, G (s)	20.0	74.0			48.8	104.0	35.0		140.0	55.2		36.0
Effective Green, g (s)	21.2	74.9			49.7	106.8	36.9		140.0	57.1		37.4
Actuated g/C Ratio	0.15	0.54			0.36	0.76	0.26		1.00	0.41		0.27
Clearance Time (s)	5.2	4.9			4.9	5.9	5.9			5.9		
Vehicle Extension (s)	2.0	4.5			4.5	4.5	3.3			4.5		
Lane Grp Cap (vph)	443	2517			1788	1217	847		1568	1387		403
v/s Ratio Prot	0.18	0.23			c0.42	0.19	c0.38			0.15		c0.44
v/s Ratio Perm						0.18			0.53			
v/c Ratio	1.17	0.43			1.19	0.48	1.43		0.53	0.37		1.63
Uniform Delay, d1	59.4	19.6			45.1	6.2	51.5		0.0	28.9		51.3
Progression Factor	0.94	1.01			1.00	1.00	1.00		1.00	1.00		1.00
Incremental Delay, d2	94.9	0.4			91.0	0.5	201.3		1.3	0.3		295.0
Delay (s)	151.1	20.2			136.1	6.7	252.8		1.3	29.2		346.3
Level of Service	F	C			F	A	F		A	C		F
Approach Delay (s)		62.8			108.3			150.3			207.8	
Approach LOS		E			F			F			F	

Intersection Summary

HCM Average Control Delay	125.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.39		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	109.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
12: 24th Street & Oak Street

PM Peak Hour
Existing Conditions
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	*0.80		0.95	0.95	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.99		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85		0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	
Satd. Flow (prot)	1770	3505	1558	3433	2948		1681	1692	1571		1724	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00		0.98	
Satd. Flow (perm)	1770	3505	1558	3433	2948		1681	1692	1571		1724	
Volume (vph)	35	1573	437	571	1668	11	628	26	510	25	18	33
Peak-hour factor, PHF	0.92	0.92	0.92	0.96	0.96	0.96	0.96	0.96	0.96	0.68	0.68	0.68
Adj. Flow (vph)	38	1710	475	595	1738	11	654	27	531	37	26	49
RTOR Reduction (vph)	0	0	97	0	0	0	0	0	107	0	0	0
Lane Group Flow (vph)	38	1710	378	595	1749	0	332	349	424	0	112	0
Confl. Peds. (#/hr)			2			2			2	2		
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot		Perm	Prot			Split		pm+ov	Split		
Protected Phases	5	2		1	6		8	8	1	7	7	
Permitted Phases			2						8			
Actuated Green, G (s)	17.6	69.6	69.6	25.0	79.0		30.0	30.0	55.0		13.4	
Effective Green, g (s)	17.8	71.5	71.5	26.2	79.9		31.9	31.9	58.1		13.8	
Actuated g/C Ratio	0.11	0.45	0.45	0.16	0.50		0.20	0.20	0.36		0.09	
Clearance Time (s)	4.2	5.9	5.9	5.2	4.9		5.9	5.9	5.2		4.4	
Vehicle Extension (s)	2.0	5.7	5.7	2.0	5.7		5.6	5.6	2.0		1.0	
Lane Grp Cap (vph)	198	1572	699	564	1478		336	339	612		149	
v/s Ratio Prot	0.02	c0.49		0.17	c0.59		0.20	c0.21	0.11		c0.06	
v/s Ratio Perm			0.24						0.16			
v/c Ratio	0.19	1.09	0.54	1.05	1.18		0.99	1.03	0.69		0.75	
Uniform Delay, d1	64.3	44.0	32.0	66.6	39.8		63.6	63.8	43.1		71.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	0.2	50.6	3.0	53.2	89.7		45.8	56.7	2.7		17.1	
Delay (s)	64.4	94.5	35.0	119.8	129.5		109.4	120.4	45.8		88.2	
Level of Service	E	F	D	F	F		F	F	D		F	
Approach Delay (s)		81.3			127.0			84.7			88.2	
Approach LOS		F			F			F			F	

Intersection Summary

HCM Average Control Delay	100.3	HCM Level of Service	F
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	159.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
19: Brimhall Road & Allen Road

PM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3344		1770	1863	1562	1770	3539	1563	1770	1863	1547
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3344		1770	1863	1562	1770	3539	1563	1770	1863	1547
Volume (vph)	24	140	67	52	188	172	93	430	61	109	400	49
Peak-hour factor, PHF	0.88	0.88	0.88	0.93	0.93	0.93	0.94	0.94	0.94	0.89	0.89	0.89
Adj. Flow (vph)	27	159	76	56	202	185	99	457	65	122	449	55
RTOR Reduction (vph)	0	0	0	0	0	37	0	0	45	0	0	21
Lane Group Flow (vph)	27	235	0	56	202	148	99	457	20	122	449	34
Confl. Peds. (#/hr)			2			2			2			2
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	1.7	10.5		3.2	12.0	12.0	4.1	14.0	14.0	4.6	14.5	14.5
Effective Green, g (s)	1.7	12.5		3.2	14.0	14.0	4.1	16.0	16.0	4.6	16.5	16.5
Actuated g/C Ratio	0.03	0.24		0.06	0.27	0.27	0.08	0.31	0.31	0.09	0.32	0.32
Clearance Time (s)	4.0	6.0		4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	58	799		108	499	418	139	1083	478	156	588	488
v/s Ratio Prot	0.02	0.07		c0.03	c0.11		0.06	0.13		c0.07	c0.24	
v/s Ratio Perm						0.09			0.01			0.02
v/c Ratio	0.47	0.29		0.52	0.40	0.35	0.71	0.42	0.04	0.78	0.76	0.07
Uniform Delay, d1	24.9	16.3		23.8	15.7	15.5	23.5	14.5	12.8	23.4	16.1	12.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.1		1.7	0.2	0.2	13.4	0.1	0.0	20.5	5.3	0.0
Delay (s)	27.0	16.4		25.5	15.9	15.7	36.9	14.6	12.8	43.9	21.4	12.6
Level of Service	C	B		C	B	B	D	B	B	D	C	B
Approach Delay (s)		17.5			17.0			17.9			25.0	
Approach LOS		B			B			B			C	

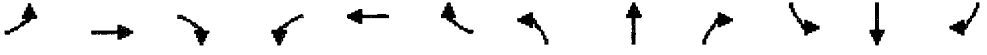
Intersection Summary

HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	52.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

22: Stockdale Highway & Allen Road

PM Peak Hour
Existing Conditions

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↰↰		↰	↰↰↰	↰	↰↰	↰	↰	↰↰	↰↰	↰
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91	1.00	0.97	1.00	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5058		1770	5085	1547	3433	1863	1562	3433	3539	1562
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5058		1770	5085	1547	3433	1863	1562	3433	3539	1562
Volume (vph)	112	642	22	172	710	485	30	59	81	434	59	136
Peak-hour factor, PHF	0.94	0.94	0.94	0.96	0.96	0.96	0.75	0.75	0.75	0.80	0.80	0.80
Adj. Flow (vph)	119	683	23	179	740	505	40	79	108	542	74	170
RTOR Reduction (vph)	0	0	0	0	0	101	0	0	94	0	0	34
Lane Group Flow (vph)	119	706	0	179	740	404	40	79	14	542	74	136
Confl. Peds. (#/hr)			2			2			2			2
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	7.5	25.2		9.4	27.1	27.1	2.5	8.3	8.3	17.2	23.0	23.0
Effective Green, g (s)	8.0	27.2		9.9	29.1	29.1	3.0	10.3	10.3	17.7	25.0	25.0
Actuated g/C Ratio	0.10	0.34		0.12	0.36	0.36	0.04	0.13	0.13	0.22	0.31	0.31
Clearance Time (s)	4.5	6.0		4.5	6.0	6.0	4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	1.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0	1.5	2.0	2.0
Lane Grp Cap (vph)	175	1696		216	1825	555	127	237	198	749	1091	482
v/s Ratio Prot	0.07	0.14		c0.10	0.15		0.01	0.04		c0.16	0.02	
v/s Ratio Perm						c0.26			0.01			c0.09
v/c Ratio	0.68	0.42		0.83	0.41	0.73	0.31	0.33	0.07	0.72	0.07	0.28
Uniform Delay, d1	35.3	20.8		34.8	19.5	22.6	38.0	32.3	31.2	29.4	19.8	21.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.3	0.1		21.3	0.1	4.0	0.5	0.3	0.1	3.0	0.0	0.1
Delay (s)	43.7	20.9		56.1	19.6	26.6	38.6	32.6	31.2	32.4	19.8	21.4
Level of Service	D	C		E	B	C	D	C	C	C	B	C
Approach Delay (s)		24.2			26.6			33.0			28.8	
Approach LOS		C			C			C			C	

Intersection Summary

HCM Average Control Delay	27.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	81.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis 23: Brimhall Road & Calloway Drive

PM Peak Hour
Existing Conditions

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	0.88	0.97	0.95	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	2748	3433	3539	1562	3433	5085	1562	3433	5085	1562
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	2748	3433	3539	1562	3433	5085	1562	3433	5085	1562
Volume (vph)	112	324	114	176	638	225	230	992	151	240	808	149
Peak-hour factor, PHF	0.86	0.86	0.86	0.95	0.95	0.95	0.90	0.90	0.90	0.95	0.95	0.95
Adj. Flow (vph)	130	377	133	185	672	237	256	1102	168	253	851	157
RTOR Reduction (vph)	0	0	26	0	0	47	0	0	33	0	0	32
Lane Group Flow (vph)	130	377	107	185	672	190	256	1102	135	253	851	125
Confl. Peds. (#/hr)			2			2			2			2
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	5.5	18.4	18.4	6.7	19.6	19.6	10.0	21.7	21.7	9.8	21.5	21.5
Effective Green, g (s)	5.5	20.4	20.4	6.7	21.6	21.6	10.0	23.7	23.7	9.8	23.5	23.5
Actuated g/C Ratio	0.07	0.27	0.27	0.09	0.28	0.28	0.13	0.31	0.31	0.13	0.31	0.31
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0
Vehicle Extension (s)	1.0	2.0	2.0	1.5	2.0	2.0	1.5	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	246	943	732	300	998	440	448	1573	483	439	1560	479
v/s Ratio Prot	0.04	0.11		c0.05	c0.19		c0.07	c0.22		0.07	0.17	
v/s Ratio Perm			0.04			0.12			0.09			0.08
v/c Ratio	0.53	0.40	0.15	0.62	0.67	0.43	0.57	0.70	0.28	0.58	0.55	0.26
Uniform Delay, d1	34.3	23.1	21.4	33.7	24.4	22.5	31.3	23.3	20.0	31.4	22.1	20.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.1	0.0	2.6	1.4	0.2	1.1	1.2	0.1	1.1	0.2	0.1
Delay (s)	35.2	23.2	21.5	36.4	25.8	22.7	32.4	24.5	20.1	32.6	22.3	20.1
Level of Service	D	C	C	D	C	C	C	C	C	C	C	C
Approach Delay (s)		25.3			26.9			25.3			24.1	
Approach LOS		C			C			C			C	

Intersection Summary

HCM Average Control Delay	25.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	76.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis 26: Stockdale Highway & Calloway Drive

PM Peak Hour
Existing Conditions
























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3335	5036	1561	3433	5085	1561	3433	5085	1561	3433	5036	1561
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3335	5036	1561	3433	5085	1561	3433	5085	1561	3433	5036	1561
Volume (vph)	137	752	151	403	1065	389	285	945	262	159	663	192
Peak-hour factor, PHF	0.84	0.84	0.84	0.87	0.87	0.87	0.83	0.83	0.83	0.90	0.90	0.90
Adj. Flow (vph)	163	895	180	463	1224	447	343	1139	316	177	737	213
RTOR Reduction (vph)	0	0	141	0	0	90	0	0	126	0	0	107
Lane Group Flow (vph)	163	895	39	463	1224	357	343	1139	190	177	737	106
Confl. Peds. (#/hr)			2			2			2			2
Heavy Vehicles (%)	5%	3%	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	7.4	21.6	21.6	22.0	36.2	36.2	10.9	34.4	34.4	9.0	32.5	32.5
Effective Green, g (s)	7.9	23.6	23.6	22.5	38.2	38.2	11.4	36.4	36.4	9.5	34.5	34.5
Actuated g/C Ratio	0.07	0.22	0.22	0.21	0.35	0.35	0.11	0.34	0.34	0.09	0.32	0.32
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	6.0	4.5	6.0	6.0	4.5	6.0	6.0
Vehicle Extension (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	244	1100	341	715	1799	552	362	1714	526	302	1609	499
v/s Ratio Prot	0.05	c0.18		0.13	c0.24		c0.10	c0.22		c0.05	0.15	
v/s Ratio Perm			0.03			0.23			0.12			0.07
v/c Ratio	0.67	0.81	0.12	0.65	0.68	0.65	0.95	0.66	0.36	0.59	0.46	0.21
Uniform Delay, d1	48.8	40.1	33.8	39.1	29.7	29.2	48.0	30.6	27.0	47.4	29.3	26.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.3	6.6	0.7	4.5	2.1	5.7	33.3	2.1	1.9	1.9	0.9	1.0
Delay (s)	54.0	46.7	34.5	43.6	31.8	35.0	81.3	32.6	28.9	49.2	30.2	27.8
Level of Service	D	D	C	D	C	C	F	C	C	D	C	C
Approach Delay (s)		45.9			35.0			41.3			32.8	
Approach LOS		D			D			D			C	

Intersection Summary

HCM Average Control Delay	38.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis 27: Brimhall Road & Coffee Road

PM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	1.00	0.88	1.00	1.00	1.00	0.97	0.91			1.00	0.91
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99			1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	3433	1863	2787	1770	1845	1561	3433	5046			1770	5085
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	3433	1863	2787	1770	1845	1561	3433	5046			1770	5085
Volume (vph)	366	55	527	64	74	37	836	1779	84	13	36	1368
Peak-hour factor, PHF	0.86	0.86	0.86	0.88	0.88	0.88	0.96	0.96	0.96	0.90	0.90	0.90
Adj. Flow (vph)	426	64	613	73	84	42	871	1853	88	14	40	1520
RTOR Reduction (vph)	0	0	128	0	0	35	0	0	0	0	0	0
Lane Group Flow (vph)	426	64	485	73	84	7	871	1941	0	0	54	1520
Confl. Peds. (#/hr)						2			2			
Heavy Vehicles (%)	2%	2%	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot	Prot	
Protected Phases	5	2		1	6		3	8		7	7	4
Permitted Phases			2			6						
Actuated Green, G (s)	13.6	17.5	17.5	6.2	10.1	10.1	12.5	30.7			4.0	22.2
Effective Green, g (s)	13.6	19.5	19.5	6.2	12.1	12.1	12.5	32.4			4.0	23.9
Actuated g/C Ratio	0.17	0.25	0.25	0.08	0.15	0.15	0.16	0.41			0.05	0.31
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	5.7			4.0	5.7
Vehicle Extension (s)	1.5	2.0	2.0	1.0	2.0	2.0	1.0	1.0			1.0	1.0
Lane Grp Cap (vph)	598	465	696	141	286	242	549	2093			91	1556
v/s Ratio Prot	c0.12	0.03		0.04	0.05		c0.25	c0.38			0.03	0.30
v/s Ratio Perm			c0.17			0.00						
v/c Ratio	0.71	0.14	0.70	0.52	0.29	0.03	1.59	0.93			0.59	0.98
Uniform Delay, d1	30.4	22.8	26.6	34.5	29.2	28.0	32.8	21.7			36.3	26.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	3.3	0.0	2.5	1.3	0.2	0.0	272.5	7.6			6.7	17.3
Delay (s)	33.7	22.8	29.1	35.8	29.4	28.0	305.3	29.4			43.0	44.2
Level of Service	C	C	C	D	C	C	F	C			D	D
Approach Delay (s)		30.5			31.5			114.8				40.6
Approach LOS		C			C			F				D
Intersection Summary												
HCM Average Control Delay			72.7				HCM Level of Service		E			
HCM Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			78.1				Sum of lost time (s)		8.0			
Intersection Capacity Utilization			77.4%				ICU Level of Service		D			
Analysis Period (min)			15									
c Critical Lane Group												













HCM Signalized Intersection Capacity Analysis
27: Brimhall Road & Coffee Road

PM Peak Hour
Existing Conditions

Movement	SBR
Left Configurations	↑
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1561
Flt Permitted	1.00
Satd. Flow (perm)	1561
Volume (vph)	371
Peak-hour factor, PHF	0.90
Adj. Flow (vph)	412
RTOR Reduction (vph)	82
Lane Group Flow (vph)	330
Confl. Peds. (#/hr)	2
Heavy Vehicles (%)	2%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	22.2
Effective Green, g (s)	23.9
Actuated g/C Ratio	0.31
Clearance Time (s)	5.7
Vehicle Extension (s)	1.0
Lane Grp Cap (vph)	478
v/s Ratio Prot	
v/s Ratio Perm	0.21
v/c Ratio	0.69
Uniform Delay, d1	23.8
Progression Factor	1.00
Incremental Delay, d2	3.5
Delay (s)	27.3
Level of Service	C
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
29: Truxtun Avenue & Coffee Road























PM Peak Hour
Existing Conditions

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	*0.75	0.95	0.88	*0.80	0.91
Frbp, ped/bikes	1.00	0.98	1.00	0.99	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	2334	3539	2753	2831	5085
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	2334	3539	2753	2831	5085
Volume (vph)	1253	1365	1368	718	514	1441
Peak-hour factor, PHF	0.89	0.89	0.95	0.95	0.94	0.94
Adj. Flow (vph)	1408	1534	1440	756	547	1533
RTOR Reduction (vph)	0	4	0	3	0	0
Lane Group Flow (vph)	1408	1530	1440	753	547	1533
Confl. Peds. (#/hr)		2		2		
Turn Type	pm+ov		pm+ov		Prot	
Protected Phases	4	1	2	4	1	6
Permitted Phases		4		2		
Actuated Green, G (s)	38.0	53.0	38.5	76.5	15.0	58.0
Effective Green, g (s)	40.0	55.5	40.5	80.5	15.5	60.0
Actuated g/C Ratio	0.37	0.51	0.38	0.75	0.14	0.56
Clearance Time (s)	6.0	4.5	6.0	6.0	4.5	6.0
Vehicle Extension (s)	2.0	1.5	2.0	2.0	1.5	2.0
Lane Grp Cap (vph)	1271	1286	1327	2154	406	2825
v/s Ratio Prot	0.41	c0.17	c0.41	0.13	0.19	0.30
v/s Ratio Perm		0.48		0.14		
v/c Ratio	1.11	1.19	1.09	0.35	1.35	0.54
Uniform Delay, d1	34.0	26.2	33.8	4.7	46.2	15.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	60.2	93.4	51.2	0.0	171.9	0.8
Delay (s)	94.2	119.7	85.0	4.8	218.2	16.0
Level of Service	F	F	F	A	F	B
Approach Delay (s)	107.5		57.4			69.2
Approach LOS	F		E			E
Intersection Summary						
HCM Average Control Delay		81.2		HCM Level of Service		F
HCM Volume to Capacity ratio		1.15				
Actuated Cycle Length (s)		108.0		Sum of lost time (s)	8.0	
Intersection Capacity Utilization		98.2%		ICU Level of Service	F	
Analysis Period (min)		15				
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis

30: Stockdale Highway & Coffee Road

PM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	0.97	*0.75		0.97	0.91		0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	5036	1560	3433	3993		3433	4940		3400	5085	1561
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	5036	1560	3433	3993		3433	4940		3400	5085	1561
Volume (vph)	430	839	120	250	991	403	203	1091	229	454	1563	562
Peak-hour factor, PHF	0.79	0.79	0.79	0.93	0.93	0.93	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	544	1062	152	269	1066	433	221	1186	249	493	1699	611
RTOR Reduction (vph)	0	0	46	0	0	0	0	0	0	0	0	133
Lane Group Flow (vph)	544	1062	106	269	1499	0	221	1435	0	493	1699	478
Confl. Peds. (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%
Turn Type	Prot		Perm	Prot			Prot			Prot		Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8									2
Actuated Green, G (s)	16.0	23.6	23.6	19.4	27.0		7.0	28.0		17.0	38.0	38.0
Effective Green, g (s)	16.0	25.6	25.6	19.4	29.0		7.0	30.0		17.0	40.0	40.0
Actuated g/C Ratio	0.15	0.24	0.24	0.18	0.27		0.06	0.28		0.16	0.37	0.37
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	1.0	2.0	2.0	1.0	2.0		1.0	2.0		1.0	2.0	2.0
Lane Grp Cap (vph)	509	1194	370	617	1072		223	1372		535	1883	578
v/s Ratio Prot	c0.16	0.21		0.08	c0.38		0.06	c0.29		c0.15	c0.33	
v/s Ratio Perm			0.07									0.31
v/c Ratio	1.07	0.89	0.29	0.44	1.40		0.99	1.05		0.92	0.90	0.83
Uniform Delay, d1	46.0	39.8	33.7	39.4	39.5		50.5	39.0		44.8	32.2	30.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	59.5	8.2	0.2	0.2	185.0		57.5	37.2		21.1	7.5	12.7
Delay (s)	105.5	48.0	33.9	39.6	224.5		107.9	76.2		66.0	39.7	43.6
Level of Service	F	D	C	D	F		F	E		E	D	D
Approach Delay (s)		64.6			196.3			80.5			45.2	
Approach LOS		E			F			F			D	

Intersection Summary

HCM Average Control Delay	90.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	93.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
35: Truxtun Avenue & Mohawk Street






















PM Peak Hour
Existing Conditions

	→	↘	↙	←	↗	↖	↘
Movement	EBT	EBR	WBL	WBT	NBU	NBL	NBR
Lane Configurations	↑↑	↑	↑↑	↑↑		↑↑	↑↑
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.95	1.00	0.97	0.95		0.97	0.88
Frpb, ped/bikes	1.00	0.98	1.00	1.00		1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	1.00	1.00		1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	3539	1554	3433	3539		3433	2701
Flt Permitted	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	3539	1554	3433	3539		3433	2701
Volume (vph)	1013	437	440	1925	20	767	291
Peak-hour factor, PHF	0.87	0.87	0.83	0.83	0.82	0.82	0.82
Adj. Flow (vph)	1164	502	530	2319	24	935	355
RTOR Reduction (vph)	0	101	0	0	0	0	10
Lane Group Flow (vph)	1164	401	530	2319	0	959	345
Confl. Peds. (#/hr)		6					12
Turn Type		Perm	Prot		Split		custom
Protected Phases	2		1	6	7	7	1
Permitted Phases		2					4
Actuated Green, G (s)	45.2	45.2	19.8	69.0		29.0	48.8
Effective Green, g (s)	47.2	47.2	19.8	71.0		29.0	48.8
Actuated g/C Ratio	0.44	0.44	0.18	0.66		0.27	0.45
Clearance Time (s)	6.0	6.0	4.0	6.0		4.0	4.0
Vehicle Extension (s)	2.0	2.0	1.5	2.0		2.0	1.5
Lane Grp Cap (vph)	1547	679	629	2327		922	1320
v/s Ratio Prot	0.33		0.15	c0.66		c0.28	0.05
v/s Ratio Perm		0.26					0.08
v/c Ratio	0.75	0.59	0.84	1.00		1.04	0.26
Uniform Delay, d1	25.5	23.1	42.6	18.4		39.5	18.4
Progression Factor	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.4	3.7	9.6	17.9		40.6	0.0
Delay (s)	28.9	26.8	52.2	36.2		80.1	18.4
Level of Service	C	C	D	D		F	B
Approach Delay (s)	28.3			39.2		63.4	
Approach LOS	C			D		E	
Intersection Summary							
HCM Average Control Delay		41.5			HCM Level of Service		D
HCM Volume to Capacity ratio		1.01					
Actuated Cycle Length (s)		108.0			Sum of lost time (s)	8.0	
Intersection Capacity Utilization		82.3%			ICU Level of Service	E	
Analysis Period (min)		15					
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis

36: Mohawk Street & California Avenue

PM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0	4.0		4.0	4.0			4.0
Lane Util. Factor		0.95	0.95	0.88	0.95	0.95		0.97	0.91			1.00
Frpb, ped/bikes		1.00	1.00	0.99	1.00	1.00		1.00	1.00			1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00
Frt		1.00	1.00	0.85	1.00	0.98		1.00	0.99			1.00
Flt Protected		0.95	0.96	1.00	0.95	1.00		0.95	1.00			0.95
Satd. Flow (prot)		1681	1695	2761	1681	1733		3433	5036			1770
Flt Permitted		0.95	0.96	1.00	0.95	1.00		0.95	1.00			0.95
Satd. Flow (perm)		1681	1695	2761	1681	1733		3433	5036			1770
Volume (vph)	18	322	30	582	104	80	11	331	932	51	11	77
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.69	0.69	0.69	0.95	0.95	0.95	0.89	0.89
Adj. Flow (vph)	23	413	38	746	151	116	16	348	981	54	12	87
RTOR Reduction (vph)	0	0	0	57	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	232	242	689	139	144	0	348	1035	0	0	99
Confl. Peds. (#/hr)				4	4					5		
Heavy Vehicles (%)	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Split	Split	pm+ov		Split			Prot			Prot	Prot
Protected Phases	4	4	4	5	3	3		5	2		1	1
Permitted Phases				4								
Actuated Green, G (s)		18.3	18.3	36.3	11.0	11.0		18.0	52.0			8.4
Effective Green, g (s)		19.6	19.6	37.6	11.0	11.0		18.0	53.0			8.4
Actuated g/C Ratio		0.18	0.18	0.35	0.10	0.10		0.17	0.49			0.08
Clearance Time (s)		5.3	5.3	4.0	4.0	4.0		4.0	5.0			4.0
Vehicle Extension (s)		2.0	2.0	1.0	1.5	1.5		1.0	2.0			1.0
Lane Grp Cap (vph)		305	308	961	171	177		572	2471			138
v/s Ratio Prot		0.14	c0.14	c0.12	0.08	c0.08		0.10	0.21			0.06
v/s Ratio Perm				0.13								
v/c Ratio		0.76	0.79	0.72	0.81	0.81		0.61	0.42			0.72
Uniform Delay, d1		42.0	42.2	30.6	47.5	47.5		41.7	17.6			48.6
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00
Incremental Delay, d2		9.6	11.5	2.1	23.5	22.9		1.3	0.5			13.7
Delay (s)		51.6	53.7	32.7	71.0	70.4		43.0	18.2			62.4
Level of Service		D	D	C	E	E		D	B			E
Approach Delay (s)			40.5			70.7			24.4			
Approach LOS			D			E			C			
Intersection Summary												
HCM Average Control Delay			34.3		HCM Level of Service				C			
HCM Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			108.0		Sum of lost time (s)				16.0			
Intersection Capacity Utilization			64.4%		ICU Level of Service				C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
36: Mohawk Street & California Avenue























PM Peak Hour
Existing Conditions

Movement	SBT	SBR
Lane Configurations	↑↑↑	↑
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	4.0
Lane Util. Factor	0.91	1.00
Frpb, ped/bikes	1.00	0.98
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	5085	1552
Flt Permitted	1.00	1.00
Satd. Flow (perm)	5085	1552
Volume (vph)	1444	366
Peak-hour factor, PHF	0.89	0.89
Adj. Flow (vph)	1622	411
RTOR Reduction (vph)	0	83
Lane Group Flow (vph)	1622	328
Confl. Peds. (#/hr)		6
Heavy Vehicles (%)	2%	2%
Turn Type	Perm	
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	42.4	42.4
Effective Green, g (s)	43.4	43.4
Actuated g/C Ratio	0.40	0.40
Clearance Time (s)	5.0	5.0
Vehicle Extension (s)	2.0	2.0
Lane Grp Cap (vph)	2043	624
v/s Ratio Prot	0.32	
v/s Ratio Perm		0.21
v/c Ratio	0.79	0.53
Uniform Delay, d1	28.4	24.5
Progression Factor	1.00	1.00
Incremental Delay, d2	3.3	3.1
Delay (s)	31.7	27.6
Level of Service	C	C
Approach Delay (s)	32.3	
Approach LOS	C	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis

37: Stockdale Highway & California Avenue

PM Peak Hour
Existing Conditions

























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		0.97	0.91	1.00	0.97	0.91		0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4861		3433	5085	1560	3433	4958		3433	5085	1560
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4861		3433	5085	1560	3433	4958		3433	5085	1560
Volume (vph)	544	1137	239	200	1343	102	374	607	102	453	1263	657
Peak-hour factor, PHF	0.91	0.91	0.91	0.92	0.92	0.92	0.83	0.83	0.83	0.90	0.90	0.90
Adj. Flow (vph)	598	1249	263	217	1460	111	451	731	123	503	1403	730
RTOR Reduction (vph)	0	0	0	0	0	33	0	0	0	0	0	145
Lane Group Flow (vph)	598	1512	0	217	1460	78	451	854	0	503	1403	585
Confl. Peds. (#/hr)			2			2			2			2
Heavy Vehicles (%)	2%	4%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%
Turn Type	Prot			Prot		Perm	Prot			Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8						6
Actuated Green, G (s)	15.7	32.7		9.0	26.0	26.0	15.8	33.0		14.7	31.9	31.9
Effective Green, g (s)	15.7	34.0		9.0	27.3	27.3	15.8	34.3		14.7	33.2	33.2
Actuated g/C Ratio	0.15	0.31		0.08	0.25	0.25	0.15	0.32		0.14	0.31	0.31
Clearance Time (s)	4.0	5.3		4.0	5.3	5.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	0.5	2.0		0.5	2.0	2.0	0.5	2.0		0.5	2.0	2.0
Lane Grp Cap (vph)	499	1530		286	1285	394	502	1575		467	1563	480
v/s Ratio Prot	c0.17	0.31		0.06	c0.29		c0.13	0.17		0.15	0.28	
v/s Ratio Perm						0.05						c0.37
v/c Ratio	1.20	0.99		0.76	1.14	0.20	0.90	0.54		1.08	0.90	1.22
Uniform Delay, d1	46.1	36.8		48.4	40.4	31.7	45.3	30.4		46.6	35.8	37.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	107.4	20.0		9.8	71.3	0.1	18.2	1.3		63.9	8.5	115.8
Delay (s)	153.5	56.8		58.2	111.7	31.8	63.5	31.7		110.6	44.3	153.2
Level of Service	F	E		E	F	C	E	C		F	D	F
Approach Delay (s)		84.2			100.2			42.7			87.1	
Approach LOS		F			F			D			F	

Intersection Summary

HCM Average Control Delay	81.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	91.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
38: Truxtun Avenue & Oak Street

PM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	*0.83	0.95	1.00	*0.85	0.95	1.00	0.97	0.95	1.00	0.97	*0.75	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	2938	3539	1583	3008	3539	1560	3433	3539	1560	3433	2794	1569
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	2938	3539	1583	3008	3539	1560	3433	3539	1560	3433	2794	1569
Volume (vph)	539	674	361	374	1055	75	293	583	309	53	774	683
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.99	0.99	0.99	0.88	0.88	0.88
Adj. Flow (vph)	580	725	388	402	1134	81	296	589	312	60	880	776
RTOR Reduction (vph)	0	0	78	0	0	52	0	0	62	0	0	6
Lane Group Flow (vph)	580	725	310	402	1134	29	296	589	250	60	880	770
Confl. Peds. (#/hr)						2			2			2
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		pm+ov
Protected Phases	3	8		7	4		1	6		5	2	3
Permitted Phases			8			4			6			2
Actuated Green, G (s)	17.0	33.4	33.4	16.6	33.0	33.0	10.6	34.1	34.1	5.7	29.2	46.2
Effective Green, g (s)	17.0	34.7	34.7	16.6	34.3	34.3	10.6	35.0	35.0	5.7	30.1	47.1
Actuated g/C Ratio	0.16	0.32	0.32	0.15	0.32	0.32	0.10	0.32	0.32	0.05	0.28	0.44
Clearance Time (s)	4.0	5.3	5.3	4.0	5.3	5.3	4.0	4.9	4.9	4.0	4.9	4.0
Vehicle Extension (s)	0.5	2.0	2.0	0.5	2.0	2.0	0.5	2.0	2.0	0.5	2.0	0.5
Lane Grp Cap (vph)	462	1137	509	462	1124	495	337	1147	506	181	779	684
v/s Ratio Prot	c0.20	0.20		0.13	c0.32		c0.09	0.17		0.02	c0.31	0.18
v/s Ratio Perm			0.20			0.02			0.16			0.31
v/c Ratio	1.26	0.64	0.61	0.87	1.01	0.06	0.88	0.51	0.49	0.33	1.13	1.13
Uniform Delay, d1	45.5	31.3	30.9	44.6	36.9	25.6	48.1	29.6	29.4	49.3	39.0	30.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.81	0.82	0.80	1.00	1.00	1.00
Incremental Delay, d2	131.7	0.9	1.4	15.8	29.0	0.0	15.6	1.1	2.3	0.4	74.2	74.4
Delay (s)	177.2	32.2	32.3	60.4	65.9	25.6	54.4	25.5	25.7	49.7	113.1	104.8
Level of Service	F	C	C	E	E	C	D	C	C	D	F	F
Approach Delay (s)		81.9			62.5			32.7			107.2	
Approach LOS		F			E			C			F	




















Intersection Summary

HCM Average Control Delay	74.4	HCM Level of Service	E
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

39: California Avenue & Chester Lane

PM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0		4.0	4.0		4.0
Lane Util. Factor		1.00	0.91			1.00	0.91		0.95	0.95		0.95
Frpb, ped/bikes		1.00	1.00			1.00	1.00		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00			1.00	1.00		1.00	1.00		1.00
Frt		1.00	0.99			1.00	0.99		1.00	0.93		1.00
Flt Protected		0.95	1.00			0.95	1.00		0.95	0.99		0.95
Satd. Flow (prot)		1770	5026			1770	5046		1681	1618		1681
Flt Permitted		0.95	1.00			0.95	1.00		0.95	0.99		0.95
Satd. Flow (perm)		1770	5026			1770	5046		1681	1618		1681
Volume (vph)	24	49	1286	82	14	53	1440	67	67	11	24	404
Peak-hour factor, PHF	0.79	0.79	0.79	0.79	0.94	0.94	0.94	0.94	0.75	0.75	0.75	0.77
Adj. Flow (vph)	30	62	1628	104	15	56	1532	71	89	15	32	525
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	92	1732	0	0	71	1603	0	70	66	0	325
Confl. Peds. (#/hr)				2				2	11			
Heavy Vehicles (%)	2%	2%	2%	4%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	Prot			Prot	Prot			Split			Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases												
Actuated Green, G (s)		8.7	52.7			6.9	50.9		7.4	7.4		23.0
Effective Green, g (s)		8.7	53.7			6.9	51.9		7.4	7.4		24.0
Actuated g/C Ratio		0.08	0.50			0.06	0.48		0.07	0.07		0.22
Clearance Time (s)		4.0	5.0			4.0	5.0		4.0	4.0		5.0
Vehicle Extension (s)		1.0	3.0			1.0	3.0		1.5	1.5		1.5
Lane Grp Cap (vph)		143	2499			113	2425		115	111		374
v/s Ratio Prot		c0.05	c0.34			0.04	0.32		c0.04	0.04		0.19
v/s Ratio Perm												
v/c Ratio		0.64	0.69			0.63	0.66		0.61	0.59		0.87
Uniform Delay, d1		48.1	20.8			49.3	21.4		48.9	48.8		40.5
Progression Factor		1.00	1.00			1.06	0.70		1.00	1.00		1.00
Incremental Delay, d2		7.2	1.6			3.1	0.6		6.1	5.6		18.2
Delay (s)		55.4	22.4			55.6	15.6		55.0	54.4		58.7
Level of Service		E	C			E	B		E	D		E
Approach Delay (s)			24.1				17.3			54.7		
Approach LOS			C				B			D		
Intersection Summary												
HCM Average Control Delay			27.8									HCM Level of Service C
HCM Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			108.0									Sum of lost time (s) 12.0
Intersection Capacity Utilization			64.0%									ICU Level of Service B
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
39: California Avenue & Chester Lane

PM Peak Hour
Existing Conditions
























Movement	SBT	SBR
Lane Configurations	↕↗	
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.99	
Flt Protected	0.97	
Satd. Flow (prot)	1691	
Flt Permitted	0.97	
Satd. Flow (perm)	1691	
Volume (vph)	77	22
Peak-hour factor, PHF	0.77	0.77
Adj. Flow (vph)	100	29
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	329	0
Confl. Peds. (#/hr)		11
Heavy Vehicles (%)	2%	2%
Turn Type		
Protected Phases	4	
Permitted Phases		
Actuated Green, G (s)	23.0	
Effective Green, g (s)	24.0	
Actuated g/C Ratio	0.22	
Clearance Time (s)	5.0	
Vehicle Extension (s)	1.5	
Lane Grp Cap (vph)	376	
v/s Ratio Prot	0.19	
v/s Ratio Perm		
v/c Ratio	0.88	
Uniform Delay, d1	40.6	
Progression Factor	1.00	
Incremental Delay, d2	19.1	
Delay (s)	59.7	
Level of Service	E	
Approach Delay (s)	59.2	
Approach LOS	E	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
40: California Avenue & SR-99 SB Ramps

PM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91			1.00	0.91	1.00		1.00	1.00	0.88	1.00
Frpb, ped/bikes	1.00	1.00			1.00	1.00	0.98		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.99			1.00	1.00	0.85		1.00	1.00	0.85	1.00
Flt Protected	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)	1770	5039			1689	5085	1546		1770	1863	2760	1770
Flt Permitted	0.95	1.00			0.95	1.00	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)	1770	5039			1689	5085	1546		1770	1863	2760	1770
Volume (vph)	268	1391	91	5	184	1156	538	1	73	39	223	256
Peak-hour factor, PHF	0.79	0.79	0.79	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.92
Adj. Flow (vph)	339	1761	115	6	209	1314	611	1	83	44	253	278
RTOR Reduction (vph)	0	0	0	0	0	0	441	0	0	0	51	0
Lane Group Flow (vph)	339	1876	0	0	215	1314	170	0	84	44	202	278
Confl. Peds. (#/hr)							2		2			
Heavy Vehicles (%)	2%	2%	2%	2%	7%	2%	2%	2%	2%	2%	3%	2%
Turn Type	Prot			Prot	Prot		Perm	Split	Split		Perm	Split
Protected Phases	5	2		1	1	6		3	3	3		4
Permitted Phases							6				3	
Actuated Green, G (s)	22.2	38.0			13.0	28.8	28.8		8.0	8.0	8.0	32.0
Effective Green, g (s)	21.9	39.3			12.7	30.1	30.1		8.0	8.0	8.0	32.0
Actuated g/C Ratio	0.20	0.36			0.12	0.28	0.28		0.07	0.07	0.07	0.30
Clearance Time (s)	3.7	5.3			3.7	5.3	5.3		4.0	4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.1			2.0	4.5	4.5		4.5	4.5	4.5	7.1
Lane Grp Cap (vph)	359	1834			199	1417	431		131	138	204	524
v/s Ratio Prot	0.19	c0.37			0.13	c0.26			0.05	0.02		0.16
v/s Ratio Perm							0.11				c0.07	
v/c Ratio	0.94	1.02			1.08	0.93	0.40		0.64	0.32	0.99	0.53
Uniform Delay, d1	42.4	34.4			47.6	37.9	31.6		48.6	47.4	50.0	31.7
Progression Factor	0.76	0.65			0.63	0.54	1.61		1.00	1.00	1.00	1.00
Incremental Delay, d2	25.7	23.5			69.7	7.1	1.4		12.5	2.3	60.2	3.1
Delay (s)	58.0	46.0			99.5	27.4	52.1		61.1	49.7	110.2	34.8
Level of Service	E	D			F	C	D		E	D	F	C
Approach Delay (s)		47.8				41.7				92.4		
Approach LOS		D				D				F		

Intersection Summary

HCM Average Control Delay	49.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			
























HCM Signalized Intersection Capacity Analysis
40: California Avenue & SR-99 SB Ramps

PM Peak Hour
Existing Conditions

Movement	SBT	SBR
Lane Configurations	↓ ↗	↗
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	4.0
Lane Util. Factor	0.95	0.95
Frpb, ped/bikes	0.99	0.99
Flpb, ped/bikes	1.00	1.00
Frt	0.92	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	1617	1483
Flt Permitted	1.00	1.00
Satd. Flow (perm)	1617	1483
Volume (vph)	198	573
Peak-hour factor, PHF	0.92	0.92
Adj. Flow (vph)	215	623
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	456	382
Confl. Peds. (#/hr)		2
Heavy Vehicles (%)	2%	2%
Turn Type		Perm
Protected Phases	4	
Permitted Phases		4
Actuated Green, G (s)	32.0	32.0
Effective Green, g (s)	32.0	32.0
Actuated g/C Ratio	0.30	0.30
Clearance Time (s)	4.0	4.0
Vehicle Extension (s)	7.1	7.1
Lane Grp Cap (vph)	479	439
v/s Ratio Prot	0.28	
v/s Ratio Perm		0.26
v/c Ratio	0.95	0.87
Uniform Delay, d1	37.2	36.0
Progression Factor	1.00	1.00
Incremental Delay, d2	30.6	19.5
Delay (s)	67.8	55.6
Level of Service	E	E
Approach Delay (s)	55.4	
Approach LOS	E	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
41: California Avenue & SR 99 NB Ramps

PM Peak Hour
Existing Conditions

												
Movement	EBL2	EBL	EBT	EBR	WBT	WBR	WBR2	NBL2	NBT	NBR	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0		4.0
Lane Util. Factor		1.00	0.91	1.00	0.86		0.86	0.95	0.95	1.00		1.00
Frpb, ped/bikes		1.00	1.00	0.98	1.00		0.98	1.00	1.00	0.99		1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00
Frt		1.00	1.00	0.85	0.98		0.85	1.00	1.00	0.85		0.90
Flt Protected		0.95	1.00	1.00	1.00		1.00	0.95	0.96	1.00		0.99
Satd. Flow (prot)		1746	5085	1549	4682		1341	1681	1689	1561		1652
Flt Permitted		0.95	1.00	1.00	1.00		1.00	0.95	0.96	1.00		0.86
Satd. Flow (perm)		1746	5085	1549	4682		1341	1681	1689	1561		1437
Volume (vph)	22	46	1178	629	1545	266	12	289	13	376	19	0
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.88	0.88	0.88	0.90	0.90	0.90	0.71	0.71
Adj. Flow (vph)	26	55	1402	749	1756	302	14	321	14	418	27	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	30	0	0
Lane Group Flow (vph)	0	81	1402	749	2058	0	14	165	170	388	0	109
Confl. Peds. (#/hr)				3		2	2			2	2	
Heavy Vehicles (%)	2%	4%	2%	2%	2%	2%	2%	2%	4%	2%	2%	2%
Turn Type	Prot	Prot		Free		Perm	Split		Perm	Perm		
Protected Phases	5	5	2		6		3	3				4
Permitted Phases				Free		6			3	4		
Actuated Green, G (s)		8.8	64.8	108.0	51.9	51.9	23.0	23.0	23.0			7.0
Effective Green, g (s)		8.5	65.7	108.0	53.2	53.2	23.6	23.6	23.6			6.7
Actuated g/C Ratio		0.08	0.61	1.00	0.49	0.49	0.22	0.22	0.22			0.06
Clearance Time (s)		3.7	4.9		5.3	5.3	4.6	4.6	4.6			3.7
Vehicle Extension (s)		2.0	5.1		4.2	4.2	5.0	5.0	5.0			1.5
Lane Grp Cap (vph)		137	3093	1549	2306		661	367	369	341		89
v/s Ratio Prot		0.05	0.28		c0.44		0.10	0.10				
v/s Ratio Perm				c0.48		0.01			c0.25			c0.08
v/c Ratio		0.59	0.45	0.48	0.89	0.02	0.45	0.46	1.14			1.22
Uniform Delay, d1		48.1	11.4	0.0	24.8	14.0	36.6	36.7	42.2			50.6
Progression Factor		0.61	0.33	1.00	0.45	0.34	1.00	1.00	1.00			1.00
Incremental Delay, d2		1.5	0.2	0.1	2.7	0.0	1.8	1.9	91.9			167.6
Delay (s)		30.6	3.9	0.1	14.0	4.9	38.4	38.6	134.1			218.3
Level of Service		C	A	A	B	A	D	D	F			F
Approach Delay (s)			3.6		13.9			91.5				218.3
Approach LOS			A		B			F				F
Intersection Summary												
HCM Average Control Delay			25.1		HCM Level of Service			C				
HCM Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			108.0		Sum of lost time (s)			12.0				
Intersection Capacity Utilization			66.6%		ICU Level of Service			C				
Analysis Period (min)			15									
c Critical Lane Group												






















HCM Signalized Intersection Capacity Analysis
41: California Avenue & SR 99 NB Ramps

PM Peak Hour
Existing Conditions

Movement	SBR	SBR2
Lane Configurations		
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)		
Lane Util. Factor		
Frpb, ped/bikes		
Flpb, ped/bikes		
Frt		
Flt Protected		
Satd. Flow (prot)		
Flt Permitted		
Satd. Flow (perm)		
Volume (vph)	49	9
Peak-hour factor, PHF	0.71	0.71
Adj. Flow (vph)	69	13
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	0	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	2%	2%
Turn Type		
Protected Phases		
Permitted Phases		
Actuated Green, G (s)		
Effective Green, g (s)		
Actuated g/C Ratio		
Clearance Time (s)		
Vehicle Extension (s)		
Lane Grp Cap (vph)		
v/s Ratio Prot		
v/s Ratio Perm		
v/c Ratio		
Uniform Delay, d1		
Progression Factor		
Incremental Delay, d2		
Delay (s)		
Level of Service		
Approach Delay (s)		
Approach LOS		
Intersection Summary		

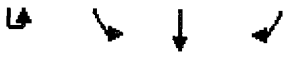



HCM Signalized Intersection Capacity Analysis
42: California Avenue & Oak Street

PM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor		*0.75	0.95	1.00		0.97	0.91	1.00		*0.75	0.91	
Frpb, ped/bikes		1.00	1.00	0.98		1.00	1.00	0.98		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	1.00		1.00	1.00	
Frt		1.00	1.00	0.85		1.00	1.00	0.85		1.00	0.98	
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	
Satd. Flow (prot)		2654	3539	1544		3433	5085	1556		2654	4947	
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00		0.95	1.00	
Satd. Flow (perm)		2654	3539	1544		3433	5085	1556		2654	4947	
Volume (vph)	3	492	720	228	23	139	784	108	4	241	395	74
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.88	0.88	0.88	0.88	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	579	847	268	26	158	891	123	4	268	439	82
RTOR Reduction (vph)	0	0	0	54	0	0	0	25	0	0	0	0
Lane Group Flow (vph)	0	583	847	214	0	184	891	98	0	272	521	0
Confl. Peds. (#/hr)				10				4				8
Turn Type	Prot	Prot		Perm	Prot	Prot		Perm	Prot	Prot		
Protected Phases	5	5	2		1	1	6		3	3	8	
Permitted Phases				2			6					
Actuated Green, G (s)		20.1	27.4	27.4		20.1	27.4	27.4		10.1	30.3	
Effective Green, g (s)		20.7	28.3	28.3		20.7	28.3	28.3		10.7	31.2	
Actuated g/C Ratio		0.19	0.26	0.26		0.19	0.26	0.26		0.10	0.29	
Clearance Time (s)		4.6	4.9	4.9		4.6	4.9	4.9		4.6	4.9	
Vehicle Extension (s)		1.5	2.0	2.0		1.0	2.0	2.0		1.0	2.0	
Lane Grp Cap (vph)		509	927	405		658	1332	408		263	1429	
v/s Ratio Prot		c0.22	c0.24			0.05	0.18			c0.10	0.11	
v/s Ratio Perm				0.14				0.06				
v/c Ratio		1.15	0.91	0.53		0.28	0.67	0.24		1.03	0.36	
Uniform Delay, d1		43.6	38.7	34.1		37.3	35.7	31.4		48.6	30.5	
Progression Factor		0.82	1.18	1.26		1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		82.8	12.3	3.9		0.1	2.7	1.4		64.7	0.1	
Delay (s)		118.7	57.7	47.0		37.4	38.3	32.8		113.3	30.6	
Level of Service		F	E	D		D	D	C		F	C	
Approach Delay (s)			77.0				37.6				59.0	
Approach LOS			E				D				E	
Intersection Summary												
HCM Average Control Delay		78.7			HCM Level of Service				E			
HCM Volume to Capacity ratio		1.09										
Actuated Cycle Length (s)		108.0			Sum of lost time (s)				16.0			
Intersection Capacity Utilization		83.9%			ICU Level of Service				E			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
42: California Avenue & Oak Street

PM Peak Hour
Existing Conditions



















				
Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0
Lane Util. Factor		1.00	0.91	*0.80
Frpb, ped/bikes		1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00
Frt		1.00	0.95	0.85
Flt Protected		0.95	1.00	1.00
Satd. Flow (prot)		1770	3217	1248
Flt Permitted		0.95	1.00	1.00
Satd. Flow (perm)		1770	3217	1248
Volume (vph)	1	140	696	687
Peak-hour factor, PHF	0.86	0.86	0.86	0.86
Adj. Flow (vph)	1	163	809	799
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	164	1176	432
Confl. Peds. (#/hr)				2
Turn Type	Prot	Prot		Perm
Protected Phases	7	7	4	
Permitted Phases				4
Actuated Green, G (s)		11.2	31.4	31.4
Effective Green, g (s)		11.8	32.3	32.3
Actuated g/C Ratio		0.11	0.30	0.30
Clearance Time (s)		4.6	4.9	4.9
Vehicle Extension (s)		0.5	2.0	2.0
Lane Grp Cap (vph)		193	962	373
v/s Ratio Prot		0.09	c0.37	
v/s Ratio Perm				0.35
v/c Ratio		0.85	1.22	1.16
Uniform Delay, d1		47.2	37.9	37.9
Progression Factor		0.86	0.65	0.65
Incremental Delay, d2		12.9	104.2	83.5
Delay (s)		53.5	128.9	108.1
Level of Service		D	F	F
Approach Delay (s)			116.8	
Approach LOS			F	

Intersection Summary

HCM Signalized Intersection Capacity Analysis









46: California Avenue & Union Avenue

PM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0			4.0	4.0		
Lane Util. Factor		0.97	0.91		0.97	0.91			1.00	0.91		
Frpb, ped/bikes		1.00	1.00		1.00	1.00			1.00	1.00		
Flpb, ped/bikes		1.00	1.00		1.00	1.00			1.00	1.00		
Frt		1.00	0.97		1.00	0.96			1.00	0.97		
Flt Protected		0.95	1.00		0.95	1.00			0.95	1.00		
Satd. Flow (prot)		3433	4926		3433	4813			1770	4905		
Flt Permitted		0.95	1.00		0.95	1.00			0.95	1.00		
Satd. Flow (perm)		3433	4926		3433	4813			1770	4905		
Volume (vph)	2	229	369	86	282	334	129	6	253	1226	248	1
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.88	0.88	0.88	0.80	0.80	0.80	0.80	0.91
Adj. Flow (vph)	2	254	410	96	320	380	147	8	316	1532	310	1
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	256	506	0	320	527	0	0	324	1842	0	0
Confl. Peds. (#/hr)				2			2				2	
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	5%	2%	2%	3%	2%	2%
Turn Type	Prot	Prot			Prot			Prot	Prot			Prot
Protected Phases	7	7	4		3	8		5	5	2		1
Permitted Phases												
Actuated Green, G (s)		11.5	18.2		13.2	19.9			20.3	40.3		
Effective Green, g (s)		12.7	18.6		14.4	20.3			20.0	40.7		
Actuated g/C Ratio		0.13	0.19		0.15	0.21			0.21	0.42		
Clearance Time (s)		5.2	4.4		5.2	4.4			3.7	4.4		
Vehicle Extension (s)		2.0	5.2		2.0	5.2			2.0	5.2		
Lane Grp Cap (vph)		448	941		508	1003			363	2050		
v/s Ratio Prot		0.07	0.10		c0.09	c0.11			c0.18	c0.38		
v/s Ratio Perm												
v/c Ratio		0.57	0.54		0.63	0.53			0.89	0.90		
Uniform Delay, d1		39.8	35.5		39.0	34.3			37.7	26.4		
Progression Factor		1.00	1.00		1.00	1.00			1.00	1.00		
Incremental Delay, d2		1.1	1.1		1.8	1.0			22.5	6.1		
Delay (s)		40.9	36.7		40.8	35.3			60.2	32.6		
Level of Service		D	D		D	D			E	C		
Approach Delay (s)			38.1			37.3				36.7		
Approach LOS			D			D				D		
Intersection Summary												
HCM Average Control Delay			36.0				HCM Level of Service			D		
HCM Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			97.4				Sum of lost time (s)			8.0		
Intersection Capacity Utilization			65.0%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
46: California Avenue & Union Avenue





















PM Peak Hour
Existing Conditions

			
Movement	SBL	SBT	SBR
Lane Configurations		  	
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	1770	5036	1560
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	1770	5036	1560
Volume (vph)	81	843	143
Peak-hour factor, PHF	0.91	0.91	0.91
Adj. Flow (vph)	89	926	157
RTOR Reduction (vph)	0	0	31
Lane Group Flow (vph)	90	926	126
Confl. Peds. (#/hr)			2
Heavy Vehicles (%)	2%	3%	2%
Turn Type	Prot		Perm
Protected Phases	1	6	
Permitted Phases			6
Actuated Green, G (s)	8.0	28.0	28.0
Effective Green, g (s)	7.7	28.4	28.4
Actuated g/C Ratio	0.08	0.29	0.29
Clearance Time (s)	3.7	4.4	4.4
Vehicle Extension (s)	2.0	5.2	5.2
Lane Grp Cap (vph)	140	1468	455
v/s Ratio Prot	0.05	0.18	
v/s Ratio Perm			0.08
v/c Ratio	0.64	0.63	0.28
Uniform Delay, d1	43.5	29.9	26.6
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	7.3	1.3	0.7
Delay (s)	50.9	31.2	27.3
Level of Service	D	C	C
Approach Delay (s)		32.2	
Approach LOS		C	
Intersection Summary			

HCM Signalized Intersection Capacity Analysis

47: Stockdale Highway & Real Road

PM Peak Hour
Existing Conditions

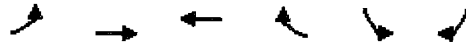
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95			1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00			0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.98			0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.97			0.99	
Satd. Flow (prot)	1770	3539	1536	1770	3512		1681	1666			1719	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.97			0.99	
Satd. Flow (perm)	1770	3539	1536	1770	3512		1681	1666			1719	
Volume (vph)	116	883	650	176	930	34	581	95	55	38	163	120
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.91	0.91	0.91	0.85	0.85	0.85
Adj. Flow (vph)	129	981	722	196	1033	38	638	104	60	45	192	141
RTOR Reduction (vph)	0	0	144	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	129	981	578	196	1071	0	406	396	0	0	378	0
Confl. Peds. (#/hr)			5			2	10		2	2		10
Heavy Vehicles (%)	2%	2%	3%	2%	2%	6%	2%	2%	6%	13%	2%	2%
Turn Type	Prot		Perm	Prot			Split			Split		
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2									
Actuated Green, G (s)	9.5	38.0	38.0	13.0	41.5		18.0	18.0			22.0	
Effective Green, g (s)	9.5	39.0	39.0	13.0	42.5		18.0	18.0			22.0	
Actuated g/C Ratio	0.09	0.36	0.36	0.12	0.39		0.17	0.17			0.20	
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	4.0			4.0	
Vehicle Extension (s)	1.5	2.0	2.0	1.5	2.0		2.0	2.0			2.0	
Lane Grp Cap (vph)	156	1278	555	213	1382		280	278			350	
v/s Ratio Prot	0.07	0.28		0.11	c0.30		c0.24	0.24			c0.22	
v/s Ratio Perm			c0.38									
v/c Ratio	0.83	0.77	1.04	0.92	0.77		1.45	1.42			1.08	
Uniform Delay, d1	48.4	30.5	34.5	47.0	28.6		45.0	45.0			43.0	
Progression Factor	1.00	1.00	1.00	0.83	0.75		1.00	1.00			1.00	
Incremental Delay, d2	27.5	4.5	49.5	35.5	3.7		221.4	210.7			71.1	
Delay (s)	76.0	35.0	84.0	74.5	25.1		266.4	255.7			114.1	
Level of Service	E	C	F	E	C		F	F			F	
Approach Delay (s)		57.2			32.7			261.1			114.1	
Approach LOS		E			C			F			F	

Intersection Summary

HCM Average Control Delay	93.2	HCM Level of Service	F
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
48: Stockdale Highway & SR-99 SB Off-Ramp

PM Peak Hour
Existing Conditions



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↘	↗
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0
Lane Util. Factor		0.95	0.95		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		3539	3539		1736	1583
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		3539	3539		1736	1583
Volume (vph)	0	1111	936	0	136	310
Peak-hour factor, PHF	0.89	0.89	0.85	0.85	0.89	0.89
Adj. Flow (vph)	0	1248	1101	0	153	348
RTOR Reduction (vph)	0	0	0	0	0	25
Lane Group Flow (vph)	0	1248	1101	0	153	323
Heavy Vehicles (%)	2%	2%	2%	2%	4%	2%
Turn Type					Perm	
Protected Phases		2	6		4	
Permitted Phases						4
Actuated Green, G (s)		70.8	70.8		28.0	28.0
Effective Green, g (s)		71.4	71.4		28.6	28.6
Actuated g/C Ratio		0.66	0.66		0.26	0.26
Clearance Time (s)		4.6	4.6		4.6	4.6
Vehicle Extension (s)		6.8	7.5		5.5	5.5
Lane Grp Cap (vph)		2340	2340		460	419
v/s Ratio Prot		c0.35	0.31		0.09	
v/s Ratio Perm						c0.20
v/c Ratio		0.53	0.47		0.33	0.77
Uniform Delay, d1		9.6	9.0		32.0	36.7
Progression Factor		0.47	0.17		1.00	1.00
Incremental Delay, d2		0.6	0.4		1.0	10.3
Delay (s)		5.1	1.9		33.1	47.0
Level of Service		A	A		C	D
Approach Delay (s)		5.1	1.9		42.7	
Approach LOS		A	A		D	
























Intersection Summary

HCM Average Control Delay	10.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis

49: Stockdale Highway & Wible Road

PM Peak Hour
Existing Conditions


												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1561	1752	3453		1770	3539	1524	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1561	1752	3453		1770	3539	1524	1770	3539	1583
Volume (vph)	177	614	456	176	510	85	205	392	157	96	629	221
Peak-hour factor, PHF	0.92	0.92	0.92	0.78	0.78	0.78	0.90	0.90	0.90	0.87	0.87	0.87
Adj. Flow (vph)	192	667	496	226	654	109	228	436	174	110	723	254
RTOR Reduction (vph)	0	0	99	0	0	0	0	0	34	0	0	51
Lane Group Flow (vph)	192	667	397	226	763	0	228	436	140	110	723	203
Confl. Peds. (#/hr)			2			7			4			
Heavy Vehicles (%)	2%	2%	2%	3%	2%	2%	2%	2%	4%	2%	2%	2%
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	20.0	36.0	36.0	14.7	30.7		15.4	29.5	29.5	9.8	23.9	23.9
Effective Green, g (s)	20.0	37.0	37.0	14.7	31.7		15.4	30.5	30.5	9.8	24.9	24.9
Actuated g/C Ratio	0.19	0.34	0.34	0.14	0.29		0.14	0.28	0.28	0.09	0.23	0.23
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	1.5	2.0	2.0	1.0	2.0		1.0	2.0	2.0	1.0	2.0	2.0
Lane Grp Cap (vph)	328	1212	535	238	1014		252	999	430	161	816	365
v/s Ratio Prot	0.11	0.19		c0.13	c0.22		c0.13	0.12		0.06	c0.20	
v/s Ratio Perm			c0.25						0.09			0.13
v/c Ratio	0.59	0.55	0.74	0.95	0.75		0.90	0.44	0.32	0.68	0.89	0.56
Uniform Delay, d1	40.2	28.8	31.3	46.3	34.6		45.6	31.7	30.6	47.6	40.2	36.7
Progression Factor	0.61	0.48	0.39	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	1.6	7.9	43.5	5.2		31.9	0.1	0.2	9.2	11.1	1.0
Delay (s)	25.9	15.3	20.1	89.8	39.7		77.5	31.8	30.8	56.7	51.2	37.7
Level of Service	C	B	C	F	D		E	C	C	E	D	D
Approach Delay (s)		18.5			51.2			44.0			48.6	
Approach LOS		B			D			D			D	

Intersection Summary

HCM Average Control Delay	38.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			














HCM Signalized Intersection Capacity Analysis
50: SR-58 Ramps & Real Road

PM Peak Hour
Existing Conditions

							
Movement	WBU	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		4.0	4.0
Lane Util. Factor		0.97	1.00	0.95		0.97	1.00
Frpb, ped/bikes		1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00
Frt		1.00	0.85	0.91		1.00	1.00
Flt Protected		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)		3433	1583	3199		3433	1863
Flt Permitted		0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)		3433	1583	3199		3433	1863
Volume (vph)	3	564	534	181	261	851	215
Peak-hour factor, PHF	0.83	0.83	0.83	0.76	0.76	0.88	0.88
Adj. Flow (vph)	4	680	643	238	343	967	244
RTOR Reduction (vph)	0	0	92	0	0	0	0
Lane Group Flow (vph)	0	684	551	581	0	967	244
Confl. Peds. (#/hr)					2		
Turn Type	Perm	custom				Prot	
Protected Phases		3 1 3 4 8		2		1 4	6
Permitted Phases	3		3				
Actuated Green, G (s)		23.3	65.1	23.2		37.2	57.6
Effective Green, g (s)		23.9	65.7	24.8		37.8	59.2
Actuated g/C Ratio		0.24	0.67	0.25		0.38	0.60
Clearance Time (s)		4.6		5.6			5.6
Vehicle Extension (s)		2.0		3.5			3.5
Lane Grp Cap (vph)		833	1056	805		1317	1120
v/s Ratio Prot			c0.35	c0.18		c0.28	0.13
v/s Ratio Perm		0.20					
v/c Ratio		0.82	0.52	0.72		0.73	0.22
Uniform Delay, d1		35.3	8.4	33.7		26.0	9.0
Progression Factor		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2		6.2	0.5	3.3		2.2	0.1
Delay (s)		41.5	8.9	37.0		28.3	9.1
Level of Service		D	A	D		C	A
Approach Delay (s)		25.7		37.0			24.4
Approach LOS		C		D			C
Intersection Summary							
HCM Average Control Delay		27.3			HCM Level of Service		C
HCM Volume to Capacity ratio		0.72					
Actuated Cycle Length (s)		98.5			Sum of lost time (s)	8.0	
Intersection Capacity Utilization		64.7%			ICU Level of Service		C
Analysis Period (min)		15					
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis
51: Wible Road & SR-99 NB Ramps

PM Peak Hour
Existing Conditions






















									
Movement	EBL	EBR	NBL	NBT	SBT	SBR	SBR2	SEL	SER
Lane Configurations									
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0				
Lane Util. Factor	0.97		1.00	0.95	0.95				
Frt	0.99		1.00	1.00	0.96				
Flt Protected	0.96		0.95	1.00	1.00				
Satd. Flow (prot)	3404		1770	3539	3386				
Flt Permitted	0.96		0.95	1.00	1.00				
Satd. Flow (perm)	3404		1770	3539	3386				
Volume (vph)	242	26	219	512	919	0	342	0	0
Peak-hour factor, PHF	0.89	0.89	0.92	0.92	0.84	0.84	0.84	0.92	0.92
Adj. Flow (vph)	272	29	238	557	1094	0	407	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	301	0	238	557	1501	0	0	0	0
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	3%	2%	2%
Turn Type			Prot						
Protected Phases	4		5	2	6				
Permitted Phases									
Actuated Green, G (s)	17.6		15.0	53.7	35.4				
Effective Green, g (s)	17.8		14.7	55.0	36.3				
Actuated g/C Ratio	0.22		0.18	0.68	0.45				
Clearance Time (s)	4.2		3.7	5.3	4.9				
Vehicle Extension (s)	8.0		2.0	4.9	5.7				
Lane Grp Cap (vph)	750		322	2409	1521				
v/s Ratio Prot	c0.09		c0.13	0.16	c0.44				
v/s Ratio Perm									
v/c Ratio	0.40		0.74	0.23	0.99				
Uniform Delay, d1	26.9		31.2	4.9	22.0				
Progression Factor	1.00		1.00	1.00	1.00				
Incremental Delay, d2	1.5		7.4	0.1	20.0				
Delay (s)	28.4		38.7	5.0	42.0				
Level of Service	C		D	A	D				
Approach Delay (s)	28.4			15.1	42.0			0.0	
Approach LOS	C			B	D			A	
Intersection Summary									
HCM Average Control Delay			32.2		HCM Level of Service			C	
HCM Volume to Capacity ratio			0.78						
Actuated Cycle Length (s)			80.8		Sum of lost time (s)			12.0	
Intersection Capacity Utilization			66.2%		ICU Level of Service			C	
Analysis Period (min)			15						
c Critical Lane Group									

HCM Signalized Intersection Capacity Analysis

52: Brundage Lane & H Street

PM Peak Hour

Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.99			1.00	1.00	0.85	1.00	0.98
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1736	3345		1770	3490			1770	3539	1556	1770	3471
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1736	3345		1770	3490			1770	3539	1556	1770	3471
Volume (vph)	72	373	120	215	415	36	26	95	370	136	46	725
Peak-hour factor, PHF	0.78	0.78	0.78	0.82	0.82	0.82	0.74	0.74	0.74	0.74	0.82	0.82
Adj. Flow (vph)	92	478	154	262	506	44	35	128	500	184	56	884
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	37	0	0
Lane Group Flow (vph)	92	632	0	262	550	0	0	163	500	147	56	1001
Confl. Peds. (#/hr)			5			8				3		
Heavy Vehicles (%)	4%	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot			Prot			Prot	Prot		Perm	Prot	
Protected Phases	7	4		3	8		5	5	2		1	6
Permitted Phases										2		
Actuated Green, G (s)	7.2	17.9		13.4	24.1			10.6	36.0	36.0	4.5	29.9
Effective Green, g (s)	6.7	18.3		12.9	24.5			10.1	36.8	36.8	4.0	30.7
Actuated g/C Ratio	0.08	0.21		0.15	0.28			0.11	0.42	0.42	0.05	0.35
Clearance Time (s)	3.5	4.4		3.5	4.4			3.5	4.8	4.8	3.5	4.8
Vehicle Extension (s)	1.0	1.5		1.0	1.5			1.0	1.5	1.5	1.0	1.5
Lane Grp Cap (vph)	132	696		259	972			203	1480	651	80	1211
v/s Ratio Prot	0.05	c0.19		c0.15	0.16			c0.09	0.14		0.03	c0.29
v/s Ratio Perm										0.09		
v/c Ratio	0.70	0.91		1.01	0.57			0.80	0.34	0.23	0.70	0.83
Uniform Delay, d1	39.7	34.0		37.5	27.2			38.0	17.3	16.5	41.4	26.2
Progression Factor	1.00	1.00		0.83	0.77			0.72	0.69	0.63	1.00	1.00
Incremental Delay, d2	12.2	15.3		51.6	0.3			18.9	0.6	0.8	19.4	6.5
Delay (s)	51.8	49.3		82.6	21.2			46.1	12.6	11.2	60.8	32.8
Level of Service	D	D		F	C			D	B	B	E	C
Approach Delay (s)		49.6			41.0				18.7			34.2
Approach LOS		D			D				B			C
Intersection Summary												
HCM Average Control Delay		35.3				HCM Level of Service			D			
HCM Volume to Capacity ratio		0.88										
Actuated Cycle Length (s)		88.0				Sum of lost time (s)			16.0			
Intersection Capacity Utilization		69.8%				ICU Level of Service			C			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
52: Brundage Lane & H Street

PM Peak Hour
Existing Conditions

Movement	SBR
Lane Configurations	
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Volume (vph)	96
Peak-hour factor, PHF	0.82
Adj. Flow (vph)	117
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

PM Peak Hour
Existing Conditions

Synchro 6 Report
11/30/2010

HCM Signalized Intersection Capacity Analysis 54: SR-58 EB Off-Ramp & H Street

PM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations	↰	↱						↕			↰	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0						4.0			4.0	4.0
Lane Util. Factor	1.00	1.00						0.95			1.00	0.95
Frpb, ped/bikes	1.00	0.99						1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00						1.00			1.00	1.00
Frt	1.00	0.93						0.97			1.00	1.00
Flt Protected	0.95	1.00						1.00			0.95	1.00
Satd. Flow (prot)	1770	1703						3406			1736	3539
Flt Permitted	0.95	1.00						1.00			0.41	1.00
Satd. Flow (perm)	1770	1703						3406			754	3539
Volume (vph)	143	138	135	0	0	0	0	475	136	2	88	948
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.92	0.92	0.97	0.97	0.97	0.84	0.84	0.84
Adj. Flow (vph)	159	153	150	0	0	0	0	490	140	2	105	1129
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	159	303	0	0	0	0	0	630	0	0	107	1129
Confl. Peds. (#/hr)			2						6			
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	4%	2%
Turn Type	Perm									Prot		Prot
Protected Phases		7						2		1	1 8	5 6 8
Permitted Phases	7											
Actuated Green, G (s)	15.0	15.0						16.7			37.0	62.8
Effective Green, g (s)	16.6	16.6						17.6			37.8	63.4
Actuated g/C Ratio	0.19	0.19						0.20			0.43	0.72
Clearance Time (s)	5.6	5.6						4.9				
Vehicle Extension (s)	3.0	3.0						4.0				
Lane Grp Cap (vph)	334	321						681			549	2550
v/s Ratio Prot		c0.18						c0.18			0.04	c0.32
v/s Ratio Perm	0.09										0.04	
v/c Ratio	0.48	0.94						0.93			0.19	0.44
Uniform Delay, d1	31.8	35.2						34.6			15.3	5.0
Progression Factor	1.00	1.00						1.00			0.63	0.19
Incremental Delay, d2	1.1	35.5						20.4			0.0	0.0
Delay (s)	32.9	70.7						54.9			9.7	1.0
Level of Service	C	E						D			A	A
Approach Delay (s)		57.7			0.0			54.9				1.7
Approach LOS		E			A			D				A
Intersection Summary												
HCM Average Control Delay		27.2										
HCM Volume to Capacity ratio		0.64										
Actuated Cycle Length (s)		88.0							8.0			
Intersection Capacity Utilization		64.3%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
54: SR-58 EB Off-Ramp & H Street

PM Peak Hour
Existing Conditions

Movement SBR

Lane Configurations

Ideal Flow (vphpl) 1900

Total Lost time (s)

Lane Util. Factor

Frpb, ped/bikes

Flpb, ped/bikes

Frt

Flt Protected

Satd. Flow (prot)

Flt Permitted

Satd. Flow (perm)

Volume (vph) 0

Peak-hour factor, PHF 0.84

Adj. Flow (vph) 0

RTOR Reduction (vph) 0

Lane Group Flow (vph) 0

Confl. Peds. (#/hr)

Heavy Vehicles (%) 2%

Turn Type

Protected Phases

Permitted Phases

Actuated Green, G (s)

Effective Green, g (s)

Actuated g/C Ratio

Clearance Time (s)

Vehicle Extension (s)

Lane Grp Cap (vph)

v/s Ratio Prot

v/s Ratio Perm

v/c Ratio

Uniform Delay, d1

Progression Factor

Incremental Delay, d2

Delay (s)

Level of Service

Approach Delay (s)























Approach LOS

Intersection Summary

HCM Signalized Intersection Capacity Analysis

55: Brundage Lane & Chester Avenue

PM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0				4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95				1.00
Flpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00				1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00				1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.98				1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00				0.95
Satd. Flow (prot)	1770	3471	1561	1770	3475		1770	3459				1770
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00				0.95
Satd. Flow (perm)	1770	3471	1561	1770	3475		1770	3459				1770
Volume (vph)	132	343	92	101	401	50	7	67	402	60	3	58
Peak-hour factor, PHF	0.93	0.93	0.93	0.87	0.87	0.87	0.80	0.80	0.80	0.80	0.79	0.79
Adj. Flow (vph)	142	369	99	116	461	57	9	84	502	75	4	73
RTOR Reduction (vph)	0	0	79	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	142	369	20	116	518	0	0	93	577	0	0	77
Confl. Peds. (#/hr)			2			2				2		
Heavy Vehicles (%)	2%	4%	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%
Turn Type	Prot		Perm	Prot			Prot	Prot			Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases			4									
Actuated Green, G (s)	8.9	17.1	17.1	8.4	16.6			6.4	40.6			6.1
Effective Green, g (s)	8.4	17.5	17.5	7.9	17.0			5.9	41.0			5.6
Actuated g/C Ratio	0.10	0.20	0.20	0.09	0.19			0.07	0.47			0.06
Clearance Time (s)	3.5	4.4	4.4	3.5	4.4			3.5	4.4			3.5
Vehicle Extension (s)	1.0	2.0	2.0	1.0	2.0			1.0	2.0			1.0
Lane Grp Cap (vph)	169	690	310	159	671			119	1612			113
v/s Ratio Prot	c0.08	0.11		0.07	c0.15			c0.05	0.17			0.04
v/s Ratio Perm			0.01									
v/c Ratio	0.84	0.53	0.06	0.73	0.77			0.78	0.36			0.68
Uniform Delay, d1	39.1	31.6	28.6	39.0	33.7			40.4	15.1			40.3
Progression Factor	1.02	1.47	3.22	1.00	1.00			1.00	0.62			1.00
Incremental Delay, d2	21.3	0.3	0.0	13.2	5.0			25.1	0.6			12.6
Delay (s)	61.3	46.7	92.2	52.2	38.7			65.4	10.0			53.0
Level of Service	E	D	F	D	D			E	A			D
Approach Delay (s)		57.5			41.2				17.7			
Approach LOS		E			D				B			
Intersection Summary												
HCM Average Control Delay			30.7			HCM Level of Service			C			
HCM Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			88.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			58.0%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
55: Brundage Lane & Chester Avenue

PM Peak Hour
Existing Conditions

Movement	SBT	SBR
Lane Configurations	↑↑↑	↑↑
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	0.91	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.97	
Flt Protected	1.00	
Satd. Flow (prot)	4937	
Flt Permitted	1.00	
Satd. Flow (perm)	4937	
Volume (vph)	804	174
Peak-hour factor, PHF	0.79	0.79
Adj. Flow (vph)	1018	220
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	1238	0
Confl. Peds. (#/hr)		2
Heavy Vehicles (%)	2%	2%
Turn Type		
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	40.3	
Effective Green, g (s)	40.7	
Actuated g/C Ratio	0.46	
Clearance Time (s)	4.4	
Vehicle Extension (s)	2.0	
Lane Grp Cap (vph)	2283	
v/s Ratio Prot	0.25	
v/s Ratio Perm		
v/c Ratio	0.54	
Uniform Delay, d1	17.0	
Progression Factor	1.00	
Incremental Delay, d2	0.9	
Delay (s)	17.9	
Level of Service	B	
Approach Delay (s)	20.0	
Approach LOS	B	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
56: SR-58 WB Off-Ramp & Chester Avenue

PM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations					↔			↔	↔			↔
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0	4.0			4.0
Lane Util. Factor					0.95			1.00	0.95			0.95
Frpb, ped/bikes					1.00			1.00	1.00			1.00
Flpb, ped/bikes					1.00			1.00	1.00			1.00
Frt					0.96			1.00	1.00			1.00
Flt Protected					0.98			0.95	1.00			1.00
Satd. Flow (prot)					3328			1770	3505			3539
Flt Permitted					0.98			0.27	1.00			1.00
Satd. Flow (perm)					3328			508	3505			3539
Volume (vph)	0	0	0	144	193	127	1	61	409	0	0	840
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.83	0.83	0.83	0.83	0.80	0.80
Adj. Flow (vph)	0	0	0	160	214	141	1	73	493	0	0	1050
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	515	0	0	74	493	0	0	1050
Confl. Peds. (#/hr)						2						
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%
Turn Type				Perm			Prot	Prot				
Protected Phases					3		5	4 5	1 2 4			6
Permitted Phases				3								
Actuated Green, G (s)					18.0			24.4	60.8			27.1
Effective Green, g (s)					18.6			25.4	61.4			28.0
Actuated g/C Ratio					0.21			0.29	0.70			0.32
Clearance Time (s)					4.6							4.9
Vehicle Extension (s)					3.0							4.0
Lane Grp Cap (vph)					703			273	2446			1126
v/s Ratio Prot								c0.03	c0.14			c0.30
v/s Ratio Perm					0.15			c0.05				
v/c Ratio					0.73			0.27	0.20			0.93
Uniform Delay, d1					32.4			26.1	4.7			29.1
Progression Factor					1.00			1.54	0.21			0.59
Incremental Delay, d2					4.0			0.5	0.0			13.3
Delay (s)					36.3			40.7	1.0			30.3
Level of Service					D			D	A			C
Approach Delay (s)		0.0			36.3				6.2			26.9
Approach LOS		A			D				A			C
Intersection Summary												
HCM Average Control Delay		23.9										
HCM Volume to Capacity ratio		0.62										
Actuated Cycle Length (s)		88.0							12.0			
Intersection Capacity Utilization		53.6%							A			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
 56: SR-58 WB Off-Ramp & Chester Avenue

PM Peak Hour
 Existing Conditions

Movement	SBR
Lane Configurations	7
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1558
Flt Permitted	1.00
Satd. Flow (perm)	1558
Volume (vph)	164
Peak-hour factor, PHF	0.80
Adj. Flow (vph)	205
RTOR Reduction (vph)	41
Lane Group Flow (vph)	164
Confl. Peds. (#/hr)	3
Heavy Vehicles (%)	2%
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	27.1
Effective Green, g (s)	28.0
Actuated g/C Ratio	0.32
Clearance Time (s)	4.9
Vehicle Extension (s)	4.0
Lane Grp Cap (vph)	496
v/s Ratio Prot	
v/s Ratio Perm	0.11
v/c Ratio	0.33
Uniform Delay, d1	22.9
Progression Factor	0.33
Incremental Delay, d2	1.5
Delay (s)	9.2
Level of Service	A
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis

57: SR-58 EB On-Ramp & Chester Avenue

PM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations		↰	↱					↰	↱		↰	↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0					4.0	4.0		4.0	4.0
Lane Util. Factor		1.00	1.00					0.95	1.00		1.00	0.95
Frpb, ped/bikes		1.00	0.98					1.00	0.97		1.00	1.00
Flpb, ped/bikes		1.00	1.00					1.00	1.00		1.00	1.00
Frt		1.00	0.85					1.00	0.85		1.00	1.00
Flt Protected		0.99	1.00					1.00	1.00		0.95	1.00
Satd. Flow (prot)		1779	1530					3539	1541		1753	3505
Flt Permitted		0.99	1.00					1.00	1.00		0.49	1.00
Satd. Flow (perm)		1779	1530					3539	1541		904	3505
Volume (vph)	65	172	125	0	0	0	0	404	156	2	231	752
Peak-hour factor, PHF	0.85	0.85	0.85	0.92	0.92	0.92	0.89	0.89	0.89	0.82	0.82	0.82
Adj. Flow (vph)	76	202	147	0	0	0	0	454	175	2	282	917
RTOR Reduction (vph)	0	0	29	0	0	0	0	0	35	0	0	0
Lane Group Flow (vph)	0	278	118	0	0	0	0	454	140	0	284	917
Confl. Peds. (#/hr)			2						3			
Heavy Vehicles (%)	9%	4%	4%	2%	2%	2%	2%	2%	2%	2%	3%	3%
Turn Type	Perm		Perm						Perm	Prot	Prot	
Protected Phases		4						2		1	1 3	3 5 6
Permitted Phases	4		4						2			
Actuated Green, G (s)		16.0	16.0					25.2	25.2		29.0	62.5
Effective Green, g (s)		16.6	16.6					26.1	26.1		29.3	63.4
Actuated g/C Ratio		0.19	0.19					0.30	0.30		0.33	0.72
Clearance Time (s)		4.6	4.6					4.9	4.9			
Vehicle Extension (s)		3.0	3.0					4.0	4.0			
Lane Grp Cap (vph)		336	289					1050	457		404	2525
v/s Ratio Prot								c0.13			c0.09	c0.26
v/s Ratio Perm		0.16	0.08						0.09		c0.15	
v/c Ratio		0.83	0.41					0.43	0.31		0.70	0.36
Uniform Delay, d1		34.3	31.4					25.0	23.9		26.2	4.7
Progression Factor		1.06	1.10					1.00	1.00		1.61	0.66
Incremental Delay, d2		11.0	0.6					1.3	1.7		1.6	0.0
Delay (s)		47.5	35.2					26.3	25.7		43.9	3.1
Level of Service		D	D					C	C		D	A
Approach Delay (s)		43.2			0.0			26.1				12.8
Approach LOS		D			A			C				B
Intersection Summary												
HCM Average Control Delay		22.2										
HCM Volume to Capacity ratio		0.64										
Actuated Cycle Length (s)		88.0							16.0			
Intersection Capacity Utilization		53.6%							A			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
57: SR-58 EB On-Ramp & Chester Avenue

























PM Peak Hour
Existing Conditions

Movement	SBR
Lane Configurations	
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Volume (vph)	0
Peak-hour factor, PHF	0.82
Adj. Flow (vph)	0
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis

58: Brundage Lane & Union Avenue

PM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0			4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.91			1.00	0.91
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.99	1.00	1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96			1.00	0.99
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (prot)	1671	3471	1525	1719	3505	1530	1770	4843			1770	4985
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00			0.95	1.00
Satd. Flow (perm)	1671	3471	1525	1719	3505	1530	1770	4843			1770	4985
Volume (vph)	99	211	106	262	278	205	73	881	288	7	97	1308
Peak-hour factor, PHF	0.92	0.92	0.92	0.88	0.88	0.88	0.90	0.90	0.90	0.75	0.75	0.75
Adj. Flow (vph)	108	229	115	298	316	233	81	979	320	9	129	1744
RTOR Reduction (vph)	0	0	23	0	0	47	0	29	0	0	0	0
Lane Group Flow (vph)	108	229	92	298	316	186	81	1270	0	0	138	1844
Confl. Peds. (#/hr)			16			2			3			
Heavy Vehicles (%)	8%	4%	2%	5%	3%	4%	2%	2%	5%	2%	2%	3%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot	Prot	
Protected Phases	7	4		3	8		5	2		1	1	6
Permitted Phases			4			8						
Actuated Green, G (s)	8.9	15.2	15.2	19.8	26.1	26.1	7.4	30.4			11.4	34.4
Effective Green, g (s)	8.6	16.1	16.1	19.5	27.0	27.0	7.1	31.3			11.1	35.3
Actuated g/C Ratio	0.09	0.17	0.17	0.21	0.29	0.29	0.08	0.33			0.12	0.38
Clearance Time (s)	3.7	4.9	4.9	3.7	4.9	4.9	3.7	4.9			3.7	4.9
Vehicle Extension (s)	2.0	5.4	5.4	2.0	5.3	5.3	2.0	4.5			2.0	5.2
Lane Grp Cap (vph)	153	595	261	357	1007	439	134	1613			209	1872
v/s Ratio Prot	0.06	0.07		c0.17	0.09		0.05	0.26			c0.08	c0.37
v/s Ratio Perm			0.06			c0.12						
v/c Ratio	0.71	0.38	0.35	0.83	0.31	0.42	0.60	0.79			0.66	0.99
Uniform Delay, d1	41.5	34.6	34.3	35.7	26.2	27.2	42.1	28.3			39.6	29.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	11.4	1.0	1.9	14.7	0.4	1.5	5.2	2.9			5.9	17.4
Delay (s)	52.9	35.5	36.3	50.5	26.7	28.7	47.3	31.3			45.6	46.5
Level of Service	D	D	D	D	C	C	D	C			D	D
Approach Delay (s)		39.9			35.6			32.2				46.4
Approach LOS		D			D			C				D

Intersection Summary

HCM Average Control Delay	39.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	94.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			





















HCM Signalized Intersection Capacity Analysis
58: Brundage Lane & Union Avenue

PM Peak Hour
Existing Conditions

Movement	SBR
Left-Through Configurations	
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frbp, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Volume (vph)	75
Peak-hour factor, PHF	0.75
Adj. Flow (vph)	100
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	4
Heavy Vehicles (%)	5%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
59: Brundage Lane & Liggett Street

PM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR2	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00			0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.96			0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1767	3505	1533	1767	3517		1719	1655			1595	
Flt Permitted	0.48	1.00	1.00	0.45	1.00		0.95	1.00			1.00	
Satd. Flow (perm)	892	3505	1533	838	3517		1719	1655			1595	
Volume (vph)	32	391	153	61	368	9	303	35	12	5	0	35
Peak-hour factor, PHF	0.85	0.85	0.85	0.89	0.89	0.89	0.88	0.88	0.88	0.80	0.80	0.80
Adj. Flow (vph)	38	460	180	69	413	10	344	40	14	6	0	44
RTOR Reduction (vph)	0	0	36	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	38	460	144	69	423	0	344	54	0	0	96	0
Confl. Peds. (#/hr)	2		2	2		2	2		2	2		
Heavy Vehicles (%)	2%	3%	3%	2%	2%	11%	5%	11%	7%	2%	2%	3%
Turn Type	Perm		Perm	Perm			Split			Split		
Protected Phases		2			6		8	8		7	7	
Permitted Phases	2		2	6								
Actuated Green, G (s)	18.0	18.0	18.0	18.0	18.0		18.0	18.0			5.0	
Effective Green, g (s)	19.9	19.9	19.9	19.9	19.9		18.2	18.2			5.2	
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36		0.33	0.33			0.09	
Clearance Time (s)	5.9	5.9	5.9	5.9	5.9		4.2	4.2			4.2	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0			2.0	
Lane Grp Cap (vph)	321	1261	552	302	1266		566	545			150	
v/s Ratio Prot		c0.13			0.12		c0.20	0.03			c0.06	
v/s Ratio Perm	0.04		0.09	0.08								
v/c Ratio	0.12	0.36	0.26	0.23	0.33		0.61	0.10			0.64	
Uniform Delay, d1	11.8	13.0	12.5	12.3	12.9		15.6	12.9			24.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.2	0.2	0.3	0.5	0.2		2.1	0.1			6.8	
Delay (s)	12.1	13.3	12.9	12.9	13.1		17.7	13.0			30.9	
Level of Service	B	B	B	B	B		B	B			C	
Approach Delay (s)		13.1			13.1			17.1			30.9	
Approach LOS		B			B			B			C	
Intersection Summary												
HCM Average Control Delay			15.1			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			55.3			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			55.3%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												





















HCM Signalized Intersection Capacity Analysis
59: Brundage Lane & Liggett Street

PM Peak Hour
Existing Conditions

Movement	SBR2
Lane Configurations	
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Volume (vph)	37
Peak-hour factor, PHF	0.80
Adj. Flow (vph)	46
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	2
Heavy Vehicles (%)	2%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

HCM Signalized Intersection Capacity Analysis
60: SR-58 EB Ramps & Union Avenue























PM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  			  	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0					4.0			4.0	
Lane Util. Factor	1.00		1.00					0.91			0.91	
Flpb, ped/bikes	1.00		1.00					1.00			1.00	
Flpb, ped/bikes	1.00		1.00					1.00			1.00	
Frt	1.00		0.85					0.97			0.97	
Flt Protected	0.95		1.00					1.00			1.00	
Satd. Flow (prot)	1703		1313					4806			4851	
Flt Permitted	0.95		1.00					1.00			1.00	
Satd. Flow (perm)	1703		1313					4806			4851	
Volume (vph)	370	0	187	0	0	0	0	879	243	0	1105	221
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.92	0.92	0.93	0.93	0.93	0.77	0.77	0.77
Adj. Flow (vph)	411	0	208	0	0	0	0	945	261	0	1435	287
RTOR Reduction (vph)	0	0	8	0	0	0	0	0	0	0	45	0
Lane Group Flow (vph)	411	0	200	0	0	0	0	1206	0	0	1677	0
Confl. Peds. (#/hr)												3
Heavy Vehicles (%)	6%	2%	23%	2%	2%	2%	2%	4%	6%	2%	4%	3%
Turn Type	Prot		custom									
Protected Phases	4							2			6	
Permitted Phases			4									
Actuated Green, G (s)	16.7		16.7					24.0			24.0	
Effective Green, g (s)	16.9		16.9					24.9			24.9	
Actuated g/C Ratio	0.34		0.34					0.50			0.50	
Clearance Time (s)	4.2		4.2					4.9			4.9	
Vehicle Extension (s)	3.0		3.0					4.0			4.0	
Lane Grp Cap (vph)	578		446					2403			2426	
v/s Ratio Prot	c0.24							0.25			c0.35	
v/s Ratio Perm			0.15									
v/c Ratio	0.71		0.45					0.50			0.69	
Uniform Delay, d1	14.3		12.8					8.3			9.5	
Progression Factor	1.00		1.00					1.00			1.00	
Incremental Delay, d2	4.1		0.7					0.2			0.9	
Delay (s)	18.4		13.5					8.5			10.4	
Level of Service	B		B					A			B	
Approach Delay (s)		16.8			0.0			8.5			10.4	
Approach LOS		B			A			A			B	
Intersection Summary												
HCM Average Control Delay			10.9					HCM Level of Service			B	
HCM Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			49.8					Sum of lost time (s)			8.0	
Intersection Capacity Utilization			53.5%					ICU Level of Service			A	
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

61: Ming Avenue & New Stine Road

PM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.91		0.97	0.91		0.97	0.91	1.00	0.97	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	4960		3433	5003		3433	5085	1560	3433	4807	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	4960		3433	5003		3433	5085	1560	3433	4807	
Volume (vph)	332	1331	235	206	1444	158	374	630	116	250	994	498
Peak-hour factor, PHF	0.86	0.86	0.86	0.96	0.96	0.96	0.89	0.89	0.89	0.94	0.94	0.94
Adj. Flow (vph)	386	1548	273	215	1504	165	420	708	130	266	1057	530
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	26	0	0	0
Lane Group Flow (vph)	386	1821	0	215	1669	0	420	708	104	266	1587	0
Confl. Peds. (#/hr)			2			2			2			2
Turn Type	Prot			Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	9.7	34.1		9.3	33.7		13.0	19.2	19.2	26.8	33.0	
Effective Green, g (s)	9.7	35.4		9.3	35.0		13.0	20.5	20.5	26.8	34.3	
Actuated g/C Ratio	0.09	0.33		0.09	0.32		0.12	0.19	0.19	0.25	0.32	
Clearance Time (s)	4.0	5.3		4.0	5.3		4.0	5.3	5.3	4.0	5.3	
Vehicle Extension (s)	0.5	2.0		0.5	2.0		0.5	2.0	2.0	0.5	2.0	
Lane Grp Cap (vph)	308	1626		296	1621		413	965	296	852	1527	
v/s Ratio Prot	0.11	c0.37		0.06	c0.33		c0.12	0.14		0.08	c0.33	
v/s Ratio Perm									0.07			
v/c Ratio	1.25	1.12		0.73	1.03		1.02	0.73	0.35	0.31	1.07dr	
Uniform Delay, d1	49.1	36.3		48.1	36.5		47.5	41.2	38.0	33.1	36.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	137.9	62.8		7.3	30.3		48.6	2.5	0.3	0.1	33.9	
Delay (s)	187.0	99.1		55.4	66.8		96.1	43.7	38.2	33.2	70.8	
Level of Service	F	F		E	E		F	D	D	C	E	
Approach Delay (s)		114.5			65.5			60.6			65.4	
Approach LOS		F			E			E			E	

Intersection Summary





















HCM Average Control Delay	79.6	HCM Level of Service	E
HCM Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
62: Ming Avenue & Real Road

PM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	0.91			1.00	*0.80		0.95	0.95	1.00	0.95
Frpb, ped/bikes		1.00	1.00			1.00	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00			1.00	1.00		1.00	1.00	1.00	1.00
Frt		1.00	0.99			1.00	0.99		1.00	1.00	0.85	1.00
Flt Protected		0.95	1.00			0.95	1.00		0.95	1.00	1.00	0.95
Satd. Flow (prot)		1770	5011			1770	4439		1681	1770	1583	1681
Flt Permitted		0.95	1.00			0.95	1.00		0.95	1.00	1.00	0.95
Satd. Flow (perm)		1770	5011			1770	4439		1681	1770	1583	1681
Volume (vph)	16	142	1455	111	20	151	1792	66	90	122	107	191
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	18	158	1617	123	22	170	2013	74	101	137	120	215
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	24	0
Lane Group Flow (vph)	0	176	1740	0	0	192	2087	0	101	137	96	195
Confl. Peds. (#/hr)				13				8	19			
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	3%	2%	2%	2%	2%
Turn Type	Prot	Prot			Prot	Prot			Split		Perm	Split
Protected Phases	5	5	2		1	1	6		8	8		7
Permitted Phases											8	
Actuated Green, G (s)		15.7	50.3			12.1	46.7		14.4	14.4	14.4	12.1
Effective Green, g (s)		15.7	51.6			12.1	48.0		15.3	15.3	15.3	13.0
Actuated g/C Ratio		0.15	0.48			0.11	0.44		0.14	0.14	0.14	0.12
Clearance Time (s)		4.0	5.3			4.0	5.3		4.9	4.9	4.9	4.9
Vehicle Extension (s)		1.0	2.0			1.0	2.0		2.0	2.0	2.0	1.0
Lane Grp Cap (vph)		257	2394			198	1973		238	251	224	202
v/s Ratio Prot		0.10	c0.35			0.11	c0.47		0.06	c0.08		0.12
v/s Ratio Perm											0.06	
v/c Ratio		0.68	0.73			0.97	1.06		0.42	0.55	0.43	0.97
Uniform Delay, d1		43.8	22.6			47.8	30.0		42.3	43.1	42.4	47.3
Progression Factor		1.00	1.00			1.10	1.23		1.00	1.00	1.00	1.00
Incremental Delay, d2		5.9	2.0			47.1	35.5		0.4	1.3	0.5	52.6
Delay (s)		49.7	24.5			99.7	72.4		42.8	44.4	42.8	99.9
Level of Service		D	C			F	E		D	D	D	F
Approach Delay (s)			26.8				74.7			43.4		
Approach LOS			C				E			D		
Intersection Summary												
HCM Average Control Delay			60.8				HCM Level of Service			E		
HCM Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			108.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			80.5%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
62: Ming Avenue & Real Road

PM Peak Hour
Existing Conditions

	↓	↙
Movement	SBT	SBR
Lane Configurations	4	7
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	4.0
Lane Util. Factor	0.95	1.00
Frbp, ped/bikes	1.00	0.94
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	1761	1491
Flt Permitted	1.00	1.00
Satd. Flow (perm)	1761	1491
Volume (vph)	165	226
Peak-hour factor, PHF	0.89	0.89
Adj. Flow (vph)	185	254
RTOR Reduction (vph)	0	51
Lane Group Flow (vph)	205	203
Confl. Peds. (#/hr)		19
Heavy Vehicles (%)	2%	2%
Turn Type		Perm
Protected Phases	7	
Permitted Phases		7
Actuated Green, G (s)	12.1	12.1
Effective Green, g (s)	13.0	13.0
Actuated g/C Ratio	0.12	0.12
Clearance Time (s)	4.9	4.9
Vehicle Extension (s)	1.0	1.0
Lane Grp Cap (vph)	212	179
v/s Ratio Prot	0.12	
v/s Ratio Perm		c0.14
v/c Ratio	0.97	1.13
Uniform Delay, d1	47.3	47.5
Progression Factor	1.00	1.00
Incremental Delay, d2	51.6	107.9
Delay (s)	98.9	155.4
Level of Service	F	F
Approach Delay (s)	121.1	
Approach LOS	F	
Intersection Summary		

HCM Signalized Intersection Capacity Analysis
63: Ming Avenue & SR-99 SB Ramps

PM Peak Hour
Existing Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↰	↑↑↑				↱			↱
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1000	1000	1000	1000	1000	1000
Total Lost time (s)		4.0		4.0	4.0				4.0			4.0
Lane Util. Factor		0.91		1.00	0.91				1.00			1.00
Frpb, ped/bikes		1.00		1.00	1.00				0.99			1.00
Flpb, ped/bikes		1.00		1.00	1.00				1.00			1.00
Frt		0.98		1.00	1.00				0.86			0.86
Flt Protected		1.00		0.95	1.00				1.00			1.00
Satd. Flow (prot)		4964		1770	5085				837			848
Flt Permitted		1.00		0.95	1.00				1.00			1.00
Satd. Flow (perm)		4964		1770	5085				837			848
Volume (vph)	0	1582	247	211	1312	0	0	0	682	0	0	875
Peak-hour factor, PHF	0.93	0.93	0.93	0.85	0.85	0.85	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	1701	266	248	1544	0	0	0	758	0	0	972
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1954	0	248	1544	0	0	0	758	0	0	972
Confl. Peds. (#/hr)			2						2			
Turn Type				Prot					Free			Free
Protected Phases		2		1	6							
Permitted Phases									Free			Free
Actuated Green, G (s)		80.7		18.0	108.0				108.0			108.0
Effective Green, g (s)		82.0		18.0	108.0				108.0			108.0
Actuated g/C Ratio		0.76		0.17	1.00				1.00			1.00
Clearance Time (s)		5.3		4.0	2.0							
Vehicle Extension (s)		2.0		1.0	4.0							
Lane Grp Cap (vph)		3769		295	5085				837			848
v/s Ratio Prot		0.39		0.14	0.30							
v/s Ratio Perm									0.91			c1.15
v/c Ratio		0.52		0.84	0.30				0.91			1.15
Uniform Delay, d1		5.2		43.6	0.0				0.0			54.0
Progression Factor		0.55		0.99	1.00				1.00			1.00
Incremental Delay, d2		0.3		9.2	0.1				15.2			79.6
Delay (s)		3.2		52.5	0.1				15.2			133.6
Level of Service		A		D	A				B			F
Approach Delay (s)		3.2			7.3			15.2			133.6	
Approach LOS		A			A			B			F	
Intersection Summary												
HCM Average Control Delay		29.3				HCM Level of Service			C			
HCM Volume to Capacity ratio		1.15										
Actuated Cycle Length (s)		108.0				Sum of lost time (s)			0.0			
Intersection Capacity Utilization		54.5%				ICU Level of Service			A			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

64: Ming Avenue & Wible Road

PM Peak Hour

Existing Conditions

	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Movement												
Lane Configurations		2	3			2	3		2	3		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0		4.0	4.0	4.0	
Lane Util. Factor		1.00	*0.65			1.00	*0.85		*0.85	0.95	1.00	
Frpb, ped/bikes		1.00	1.00			1.00	0.99		1.00	1.00	0.98	
Flpb, ped/bikes		1.00	1.00			1.00	1.00		1.00	1.00	1.00	
Frt		1.00	0.97			1.00	0.98		1.00	1.00	0.85	
Flt Protected		0.95	1.00			0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1770	4686			1741	4644		3008	3539	1423	
Flt Permitted		0.95	1.00			0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1770	4686			1741	4644		3008	3539	1423	
Volume (vph)	7	189	1685	383	22	109	1159	139	158	315	218	19
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.86	0.86	0.86	0.86	0.90	0.90	0.90	0.86
Adj. Flow (vph)	8	215	1915	435	26	127	1348	162	176	350	242	22
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	48	0
Lane Group Flow (vph)	0	223	2350	0	0	153	1510	0	176	350	194	0
Confl. Peds. (#/hr)				3				3			8	
Heavy Vehicles (%)	2%	2%	2%	3%	2%	4%	2%	2%	2%	2%	11%	2%
Turn Type	Prot	Prot			Prot	Prot			Prot		Perm	Prot
Protected Phases	5	5	2		1	1	6		3	8		7
Permitted Phases												
Actuated Green, G (s)		17.5	44.2			10.5	37.2		8.3	18.4	18.4	
Effective Green, g (s)		17.5	45.5			10.5	38.5		8.3	19.7	19.7	
Actuated g/C Ratio		0.16	0.42			0.10	0.36		0.08	0.18	0.18	
Clearance Time (s)		4.0	5.3			4.0	5.3		4.0	5.3	5.3	
Vehicle Extension (s)		1.5	2.0			1.0	2.0		1.0	2.0	2.0	
Lane Grp Cap (vph)		287	1974			169	1656		231	646	260	
v/s Ratio Prot		c0.13	c0.50			0.09	0.33		c0.06	0.10		
v/s Ratio Perm												
v/c Ratio		0.78	1.19			0.91	0.91		0.76	0.54	0.75	
Uniform Delay, d1		43.4	31.2			48.3	33.1		48.9	40.1	41.8	
Progression Factor		0.74	0.76			1.06	0.54		1.00	1.00	1.00	
Incremental Delay, d2		9.2	90.0			27.9	5.5		12.5	0.5	9.7	
Delay (s)		41.2	113.8			79.0	23.3		61.4	40.6	51.5	
Level of Service		D	F			E	C		E	D	D	
Approach Delay (s)			107.5				28.5			48.8		
Approach LOS			F				C			D		
Intersection Summary												
HCM Average Control Delay		68.1										
HCM Volume to Capacity ratio		0.99										
Actuated Cycle Length (s)		108.0										
Intersection Capacity Utilization		75.1%										
Analysis Period (min)		15										
c Critical Lane Group												
HCM Level of Service									E			
Sum of lost time (s)									12.0			
ICU Level of Service									D			






















HCM Signalized Intersection Capacity Analysis
64: Ming Avenue & Wible Road

PM Peak Hour
Existing Conditions

Movement	SBL	SBT	SBR
Lane Configurations	↰↱	↰↱	
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.0	4.0	
Lane Util. Factor	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.95	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	3403	3380	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	3403	3380	
Volume (vph)	171	463	199
Peak-hour factor, PHF	0.86	0.86	0.86
Adj. Flow (vph)	199	538	231
RTOR Reduction (vph)	0	0	0
Lane Group Flow (vph)	221	769	0
Confl. Peds. (#/hr)			
Heavy Vehicles (%)	3%	2%	2%
Turn Type	Prot		
Protected Phases	7	4	
Permitted Phases			
Actuated Green, G (s)	16.3	26.4	
Effective Green, g (s)	16.3	27.7	
Actuated g/C Ratio	0.15	0.26	
Clearance Time (s)	4.0	5.3	
Vehicle Extension (s)	1.5	2.0	
Lane Grp Cap (vph)	514	867	
v/s Ratio Prot	0.06	c0.23	
v/s Ratio Perm			
v/c Ratio	0.43	0.89	
Uniform Delay, d1	41.6	38.6	
Progression Factor	1.00	1.00	
Incremental Delay, d2	0.2	10.6	
Delay (s)	41.8	49.2	
Level of Service	D	D	
Approach Delay (s)		47.6	
Approach LOS		D	
Intersection Summary			

HCM Signalized Intersection Capacity Analysis
65: Ming Avenue & SR-99 NB Ramps

PM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		*0.80	*0.85	1.00		*0.80	*0.85	1.00	0.91	*0.80	1.00	
Frpb, ped/bikes		1.00	1.00	0.98		1.00	1.00	0.97	1.00	1.00	0.98	
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		2831	4704	1557		2831	4750	1532	1610	2975	1557	
Flt Permitted		0.95	1.00	1.00		0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		2831	4704	1557		2831	4750	1532	1610	2975	1557	
Volume (vph)	34	766	1016	280	30	46	1052	298	89	150	46	1
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.86	0.86	0.86	0.86	0.87	0.87	0.87	0.90
Adj. Flow (vph)	37	824	1092	301	35	53	1223	347	102	172	53	1
RTOR Reduction (vph)	0	0	0	61	0	0	0	70	0	0	47	0
Lane Group Flow (vph)	0	861	1092	240	0	88	1223	277	96	178	6	0
Confl. Peds. (#/hr)				3				14			4	
Heavy Vehicles (%)	2%	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	Prot		Perm	Prot	Prot		Perm	Split		Perm	Split
Protected Phases	5	5	2		1	1	6		3	3		4
Permitted Phases				2			6				3	
Actuated Green, G (s)		30.8	59.7	59.7		6.0	34.9	34.9	13.0	13.0	13.0	
Effective Green, g (s)		30.8	61.0	61.0		6.0	36.2	36.2	13.0	13.0	13.0	
Actuated g/C Ratio		0.29	0.56	0.56		0.06	0.34	0.34	0.12	0.12	0.12	
Clearance Time (s)		4.0	5.3	5.3		4.0	5.3	5.3	4.0	4.0	4.0	
Vehicle Extension (s)		2.0	2.0	2.0		1.0	2.0	2.0	1.5	1.5	1.5	
Lane Grp Cap (vph)		807	2657	879		157	1592	514	194	358	187	
v/s Ratio Prot		c0.30	0.23			0.03	c0.26		0.06	c0.06		
v/s Ratio Perm				0.15				0.18			0.00	
v/c Ratio		1.07	0.41	0.27		0.56	0.77	0.54	0.49	0.50	0.03	
Uniform Delay, d1		38.6	13.3	12.1		49.7	32.1	29.1	44.4	44.4	42.0	
Progression Factor		0.48	0.24	0.06		0.93	1.01	1.01	1.00	1.00	1.00	
Incremental Delay, d2		33.0	0.0	0.1		2.5	3.3	3.7	0.7	0.4	0.0	
Delay (s)		51.7	3.2	0.7		48.8	35.7	33.0	45.2	44.8	42.0	
Level of Service		D	A	A		D	D	C	D	D	D	
Approach Delay (s)			21.4				35.8			44.5		
Approach LOS			C				D			D		
Intersection Summary												
HCM Average Control Delay		40.4										
HCM Volume to Capacity ratio		0.90										
Actuated Cycle Length (s)		108.0										
Intersection Capacity Utilization		80.2%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
65: Ming Avenue & SR-99 NB Ramps





















PM Peak Hour
Existing Conditions



Movement	SBL	SBT	SBR
Lane Configurations			
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0
Lane Util. Factor	0.91	*0.80	1.00
Frpb, ped/bikes	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	0.98	1.00
Satd. Flow (prot)	1610	2914	1583
Flt Permitted	0.95	0.98	1.00
Satd. Flow (perm)	1610	2914	1583
Volume (vph)	95	53	254
Peak-hour factor, PHF	0.90	0.90	0.90
Adj. Flow (vph)	106	59	282
RTOR Reduction (vph)	0	0	56
Lane Group Flow (vph)	58	108	226
Confl. Peds. (#/hr)	4		
Heavy Vehicles (%)	2%	2%	2%
Turn Type	Split		Perm
Protected Phases	4	4	
Permitted Phases			4
Actuated Green, G (s)	12.0	12.0	12.0
Effective Green, g (s)	12.0	12.0	12.0
Actuated g/C Ratio	0.11	0.11	0.11
Clearance Time (s)	4.0	4.0	4.0
Vehicle Extension (s)	1.5	1.5	1.5
Lane Grp Cap (vph)	179	324	176
v/s Ratio Prot	0.04	0.04	
v/s Ratio Perm			c0.14
v/c Ratio	0.32	0.33	1.28
Uniform Delay, d1	44.3	44.3	48.0
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.2	163.9
Delay (s)	44.6	44.5	211.9
Level of Service	D	D	F
Approach Delay (s)		149.9	
Approach LOS		F	
Intersection Summary			

HCM Signalized Intersection Capacity Analysis
66: Ming Avenue & Castro Lane

PM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor		1.00	0.91			1.00	0.91		0.95	0.95	1.00	0.95
Frpb, ped/bikes		1.00	1.00			1.00	1.00		1.00	1.00	0.97	1.00
Flpb, ped/bikes		1.00	1.00			1.00	1.00		1.00	1.00	1.00	1.00
Frt		1.00	0.98			1.00	0.99		1.00	1.00	0.85	1.00
Flt Protected		0.95	1.00			0.95	1.00		0.95	0.96	1.00	0.95
Satd. Flow (prot)		1770	4890			1770	5047		1681	1696	1530	1665
Flt Permitted		0.95	1.00			0.95	1.00		0.95	0.96	1.00	0.95
Satd. Flow (perm)		1770	4890			1770	5047		1681	1696	1530	1665
Volume (vph)	25	66	960	136	35	51	895	40	215	16	45	62
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.73
Adj. Flow (vph)	27	70	1021	145	41	59	1041	47	250	19	52	85
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	46	0
Lane Group Flow (vph)	0	97	1166	0	0	100	1088	0	131	138	6	85
Confl. Peds. (#/hr)				2				2			15	15
Heavy Vehicles (%)	2%	2%	4%	2%	2%	2%	2%	2%	2%	2%	2%	3%
Turn Type	Prot	Prot			Prot	Prot			Split		Perm	Split
Protected Phases	5	5	2		1	1	6		4	4		3
Permitted Phases											4	
Actuated Green, G (s)		7.8	54.1			11.5	57.8		13.1	13.1	13.1	12.0
Effective Green, g (s)		7.8	55.4			11.5	59.1		13.1	13.1	13.1	12.0
Actuated g/C Ratio		0.07	0.51			0.11	0.55		0.12	0.12	0.12	0.11
Clearance Time (s)		4.0	5.3			4.0	5.3		4.0	4.0	4.0	4.0
Vehicle Extension (s)		1.0	2.0			1.0	2.0		1.5	1.5	1.5	1.0
Lane Grp Cap (vph)		128	2508			188	2762		204	206	186	185
v/s Ratio Prot		c0.05	c0.24			c0.06	0.22		0.08	c0.08		0.05
v/s Ratio Perm											0.00	
v/c Ratio		0.76	0.46			0.53	0.39		0.64	0.67	0.03	0.46
Uniform Delay, d1		49.2	16.8			45.7	14.1		45.2	45.4	41.9	45.0
Progression Factor		1.04	0.36			1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2		19.0	0.6			1.4	0.4		5.1	6.3	0.0	0.7
Delay (s)		70.2	6.6			47.1	14.5		50.3	51.6	41.9	45.6
Level of Service		E	A			D	B		D	D	D	D
Approach Delay (s)			11.5				17.3			49.5		
Approach LOS			B				B			D		

Intersection Summary

HCM Average Control Delay	24.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
66: Ming Avenue & Castro Lane

PM Peak Hour
Existing Conditions



Movement	SBT	SBR
Lane Configurations	↓	↘
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	0.95	
Frpb, ped/bikes	1.00	
Flpb, ped/bikes	1.00	
Frt	0.87	
Flt Protected	1.00	
Satd. Flow (prot)	1532	
Flt Permitted	1.00	
Satd. Flow (perm)	1532	
Volume (vph)	19	105
Peak-hour factor, PHF	0.73	0.73
Adj. Flow (vph)	26	144
RTOR Reduction (vph)	0	0
Lane Group Flow (vph)	170	0
Confl. Peds. (#/hr)		
Heavy Vehicles (%)	2%	3%
Turn Type		
Protected Phases	3	
Permitted Phases		
Actuated Green, G (s)	12.0	
Effective Green, g (s)	12.0	
Actuated g/C Ratio	0.11	
Clearance Time (s)	4.0	
Vehicle Extension (s)	1.0	
Lane Grp Cap (vph)	170	
v/s Ratio Prot	0.11	
v/s Ratio Perm		
v/c Ratio	1.00	
Uniform Delay, d1	48.0	
Progression Factor	1.00	
Incremental Delay, d2	69.0	
Delay (s)	117.0	
Level of Service	F	
Approach Delay (s)	93.2	
Approach LOS	F	
Intersection Summary		

67: Ming Avenue & H Street

Existing Conditions

Fehr & Peers Associates, Inc.

HCM Signalized Intersection Capacity Analysis
67: Ming Avenue & H Street

PM Peak Hour
Existing Conditions





















Movement	SBU	SBL	SBT	SBR
Lane Configurations		←	↑↑	↗
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	4.0
Lane Util. Factor		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00	1.00
Frt		1.00	1.00	0.85
Flt Protected		0.95	1.00	1.00
Satd. Flow (prot)		1770	3539	1554
Flt Permitted		0.95	1.00	1.00
Satd. Flow (perm)		1770	3539	1554
Volume (vph)	2	50	805	181
Peak-hour factor, PHF	0.84	0.84	0.84	0.84
Adj. Flow (vph)	2	60	958	215
RTOR Reduction (vph)	0	0	0	42
Lane Group Flow (vph)	0	62	958	173
Confl. Peds. (#/hr)				5
Heavy Vehicles (%)	2%	2%	2%	2%
Turn Type	Prot	Prot		Perm
Protected Phases	1	1	6	
Permitted Phases				6
Actuated Green, G (s)		5.8	34.9	34.9
Effective Green, g (s)		5.8	36.2	36.2
Actuated g/C Ratio		0.07	0.41	0.41
Clearance Time (s)		4.0	5.3	5.3
Vehicle Extension (s)		1.0	4.0	4.0
Lane Grp Cap (vph)		117	1456	639
v/s Ratio Prot		0.04	0.27	
v/s Ratio Perm				0.11
v/c Ratio		0.53	0.66	0.27
Uniform Delay, d1		39.8	20.9	17.2
Progression Factor		1.00	1.00	1.00
Incremental Delay, d2		2.0	2.3	1.0
Delay (s)		41.8	23.2	18.2
Level of Service		D	C	B
Approach Delay (s)			23.3	
Approach LOS			C	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
68: Ming Avenue & Chester Avenue

PM Peak Hour
Existing Conditions




												
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0			4.0	4.0		
Lane Util. Factor		1.00	0.95		1.00	0.95			1.00	0.95		
Frpb, ped/bikes		1.00	1.00		1.00	1.00			1.00	1.00		
Flpb, ped/bikes		1.00	1.00		1.00	1.00			1.00	1.00		
Frt		1.00	0.97		1.00	0.99			1.00	0.98		
Flt Protected		0.95	1.00		0.95	1.00			0.95	1.00		
Satd. Flow (prot)		1754	3374		1752	3482			1724	3429		
Flt Permitted		0.95	1.00		0.95	1.00			0.95	1.00		
Satd. Flow (perm)		1754	3374		1752	3482			1724	3429		
Volume (vph)	10	140	324	77	115	436	39	10	92	330	53	6
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.93	0.93	0.93	0.86	0.86	0.86	0.86	0.84
Adj. Flow (vph)	11	152	352	84	124	469	42	12	107	384	62	7
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	163	436	0	124	511	0	0	119	446	0	0
Confl. Peds. (#/hr)				5			11				7	
Heavy Vehicles (%)	2%	3%	3%	6%	3%	2%	5%	2%	5%	2%	8%	2%
Turn Type	Prot	Prot			Prot			Prot	Prot			Prot
Protected Phases	5	5	2		1	6		3	3	8		7
Permitted Phases												
Actuated Green, G (s)		8.2	18.2		6.9	16.9			6.8	21.0		
Effective Green, g (s)		8.2	19.1		6.9	17.8			6.8	22.3		
Actuated g/C Ratio		0.12	0.28		0.10	0.26			0.10	0.33		
Clearance Time (s)		4.0	4.9		4.0	4.9			4.0	5.3		
Vehicle Extension (s)		1.0	2.0		1.0	2.0			1.0	2.0		
Lane Grp Cap (vph)		211	946		178	910			172	1123		
v/s Ratio Prot		c0.09	0.13		0.07	c0.15			c0.07	c0.13		
v/s Ratio Perm												
v/c Ratio		0.77	0.46		0.70	0.56			0.69	0.40		
Uniform Delay, d1		29.0	20.2		29.6	21.8			29.6	17.7		
Progression Factor		1.00	1.00		1.00	1.00			1.00	1.00		
Incremental Delay, d2		14.7	0.1		9.2	0.5			9.3	0.1		
Delay (s)		43.7	20.4		38.8	22.2			38.9	17.8		
Level of Service		D	C		D	C			D	B		
Approach Delay (s)			26.7			25.5				22.2		
Approach LOS			C			C				C		

Intersection Summary

HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	68.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			


HCM Signalized Intersection Capacity Analysis
68: Ming Avenue & Chester Avenue

PM Peak Hour
Existing Conditions

Movement	SBL	SBT	SBR
Lane Configurations			
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1554
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1554
Volume (vph)	44	479	234
Peak-hour factor, PHF	0.84	0.84	0.84
Adj. Flow (vph)	52	570	279
RTOR Reduction (vph)	0	0	57
Lane Group Flow (vph)	59	570	222
Confl. Peds. (#/hr)			9
Heavy Vehicles (%)	2%	2%	2%
Turn Type	Prot		Perm
Protected Phases	7	4	
Permitted Phases			4
Actuated Green, G (s)	3.8	18.0	18.0
Effective Green, g (s)	3.8	19.3	19.3
Actuated g/C Ratio	0.06	0.28	0.28
Clearance Time (s)	4.0	5.3	5.3
Vehicle Extension (s)	1.0	2.0	2.0
Lane Grp Cap (vph)	99	1003	440
v/s Ratio Prot	0.03	0.16	
v/s Ratio Perm			0.14
v/c Ratio	0.60	0.57	0.51
Uniform Delay, d1	31.4	20.8	20.4
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	6.3	0.4	0.3
Delay (s)	37.7	21.3	20.7
Level of Service	D	C	C
Approach Delay (s)		22.2	
Approach LOS		C	
Intersection Summary			

HCM Signalized Intersection Capacity Analysis 69: White Lane & Wible Road

PM Peak Hour
Existing Conditions

												
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations		↔↔	↔↔↔			↔↔	↔↔↔	↔	↔↔	↔↔	↔	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0			4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor		0.97	0.72			0.97	0.91	1.00	0.97	0.95	1.00	
Frpb, ped/bikes		1.00	1.00			1.00	1.00	0.99	1.00	1.00	0.99	
Flpb, ped/bikes		1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.99			1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected		0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)		3433	3977			3400	4988	1546	3433	3539	1546	
Flt Permitted		0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (perm)		3433	3977			3400	4988	1546	3433	3539	1546	
Volume (vph)	3	105	1259	95	4	392	1501	225	163	334	460	20
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.94	0.94	0.94	0.94	0.82	0.82	0.82	0.84
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	130%	100%	100%	100%	100%	100%
Adj. Flow (vph)	3	113	1354	102	4	417	2076	239	199	407	561	24
RTOR Reduction (vph)	0	0	0	0	0	0	0	48	0	0	114	0
Lane Group Flow (vph)	0	116	1456	0	0	421	2076	191	199	407	447	0
Confl. Peds. (#/hr)				2				2			2	
Heavy Vehicles (%)	2%	2%	2%	2%	2%	3%	4%	3%	2%	2%	3%	2%
Turn Type	Prot	Prot			Prot	Prot		Perm	Prot		Perm	Prot
Protected Phases	5	5	2		1	1	6		3	8		7
Permitted Phases								6			8	
Actuated Green, G (s)		10.3	32.8			15.1	37.6	37.6	23.6	29.7	29.7	
Effective Green, g (s)		10.3	34.5			15.1	39.3	39.3	23.6	31.0	31.0	
Actuated g/C Ratio		0.10	0.32			0.14	0.36	0.36	0.22	0.29	0.29	
Clearance Time (s)		4.0	5.7			4.0	5.7	5.7	4.0	5.3	5.3	
Vehicle Extension (s)		1.0	2.0			1.0	2.0	2.0	1.0	2.0	2.0	
Lane Grp Cap (vph)		327	1270			475	1815	563	750	1016	444	
v/s Ratio Prot		0.03	c0.37			0.12	c0.42		0.06	0.11		
v/s Ratio Perm								0.12			c0.29	
v/c Ratio		0.35	1.15			0.89	1.14	0.34	0.27	0.40	1.01	
Uniform Delay, d1		45.7	36.8			45.6	34.4	24.9	35.0	31.0	38.5	
Progression Factor		1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2	75.6			17.3	71.8	1.6	0.1	0.1	44.4	
Delay (s)		46.0	112.3			62.9	106.2	26.6	35.1	31.1	82.9	
Level of Service		D	F			E	F	C	D	C	F	
Approach Delay (s)			107.4				92.6			56.7		
Approach LOS			F				F			E		
Intersection Summary												
HCM Average Control Delay		83.3										
HCM Volume to Capacity ratio		1.04										
Actuated Cycle Length (s)		108.0										
Intersection Capacity Utilization		86.5%							12.0			
Analysis Period (min)		15							E			
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis
69: White Lane & Wible Road

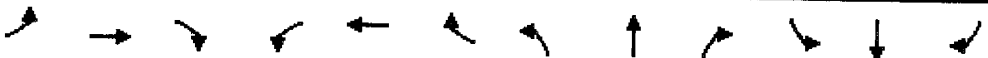
PM Peak Hour
Existing Conditions

Movement	SBL	SBT	SBR
Lane Configurations	↘↗	↑↑	↗
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00
Frt	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1560
Flt Permitted	0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1560
Volume (vph)	217	370	158
Peak-hour factor, PHF	0.84	0.84	0.84
Growth Factor (vph)	100%	100%	100%
Adj. Flow (vph)	258	440	188
RTOR Reduction (vph)	0	0	38
Lane Group Flow (vph)	282	440	150
Confl. Peds. (#/hr)			2
Heavy Vehicles (%)	2%	2%	2%
Turn Type	Prot		Perm
Protected Phases	7	4	
Permitted Phases			4
Actuated Green, G (s)	11.4	17.5	17.5
Effective Green, g (s)	11.4	18.8	18.8
Actuated g/C Ratio	0.11	0.17	0.17
Clearance Time (s)	4.0	5.3	5.3
Vehicle Extension (s)	1.0	2.0	2.0
Lane Grp Cap (vph)	362	616	272
v/s Ratio Prot	0.08	0.12	
v/s Ratio Perm			0.10
v/c Ratio	0.78	0.71	0.55
Uniform Delay, d1	47.1	42.1	40.7
Progression Factor	1.00	1.00	1.00
Incremental Delay, d2	9.3	3.3	1.4
Delay (s)	56.4	45.3	42.1
Level of Service	E	D	D
Approach Delay (s)		48.1	
Approach LOS		D	
Intersection Summary			

HCM Signalized Intersection Capacity Analysis

70: White Lane & SR-99 SB Ramps


PM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↗		↑↑↑					↖↖		↖↖
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0					4.0		4.0
Lane Util. Factor		*0.75	1.00		0.91					0.97		0.88
Frpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Flpb, ped/bikes		1.00	1.00		1.00					1.00		1.00
Frt		1.00	0.85		0.98					1.00		0.85
Flt Protected		1.00	1.00		1.00					0.95		1.00
Satd. Flow (prot)		5534	1583		4912					3433		2760
Flt Permitted		1.00	1.00		1.00					0.95		1.00
Satd. Flow (perm)		5534	1583		4912					3433		2760
Volume (vph)	0	1802	138	0	783	139	0	0	0	690	0	1339
Peak-hour factor, PHF	0.92	0.92	0.92	0.84	0.84	0.84	0.92	0.92	0.92	0.88	0.88	0.88
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	150%
Adj. Flow (vph)	0	1959	150	0	932	165	0	0	0	784	0	2282
RTOR Reduction (vph)	0	0	55	0	28	0	0	0	0	0	0	10
Lane Group Flow (vph)	0	1959	95	0	1069	0	0	0	0	784	0	2272
Confl. Peds. (#/hr)						2						
Heavy Vehicles (%)	2%	3%	2%	2%	3%	2%	2%	2%	2%	2%	2%	3%
Turn Type		Perm								custom		custom
Protected Phases		2			6					4		4
Permitted Phases			2							4		4
Actuated Green, G (s)		24.4	24.4		24.4					53.7		53.7
Effective Green, g (s)		26.7	26.7		26.7					55.3		55.3
Actuated g/C Ratio		0.30	0.30		0.30					0.61		0.61
Clearance Time (s)		6.3	6.3		6.3					5.6		5.6
Vehicle Extension (s)		4.3	4.3		4.9					3.4		3.4
Lane Grp Cap (vph)		1642	470		1457					2109		1696
v/s Ratio Prot		c0.35			0.22					0.23		
v/s Ratio Perm			0.06									c0.82
v/c Ratio		1.19	0.20		0.73					0.37		1.34
Uniform Delay, d1		31.6	23.7		28.5					8.7		17.4
Progression Factor		1.00	1.00		1.00					1.00		1.00
Incremental Delay, d2		93.2	0.3		2.3					0.1		156.9
Delay (s)		124.8	24.0		30.8					8.8		174.3
Level of Service		F	C		C					A		F
Approach Delay (s)		117.7			30.8			0.0			131.9	
Approach LOS		F			C			A			F	
Intersection Summary												
HCM Average Control Delay		109.5								F		
HCM Volume to Capacity ratio		1.29										
Actuated Cycle Length (s)		90.0								8.0		
Intersection Capacity Utilization		95.2%								F		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

71: White Lane & SR-99 NB Ramps

PM Peak Hour
Existing Conditions

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑		↑↑↑	↑	↑		↑			
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0		4.0			
Lane Util. Factor		0.86	0.86		0.91	1.00	1.00		1.00			
Frpb, ped/bikes		1.00	1.00		1.00	0.98	1.00		1.00			
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00		1.00			
Frt		0.98	0.85		1.00	0.85	1.00		0.85			
Flt Protected		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (prot)		4682	1335		5085	1550	1752		1538			
Flt Permitted		1.00	1.00		1.00	1.00	0.95		1.00			
Satd. Flow (perm)		4682	1335		5085	1550	1752		1538			
Volume (vph)	0	1337	1155	0	732	457	190	0	148	0	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.91	0.91	0.91	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	0	1453	1255	0	804	502	211	0	164	0	0	0
RTOR Reduction (vph)	0	36	0	0	0	0	0	0	11	0	0	0
Lane Group Flow (vph)	0	1678	994	0	804	502	211	0	153	0	0	0
Confl. Peds. (#/hr)						2						
Heavy Vehicles (%)	2%	2%	4%	2%	2%	2%	3%	2%	5%	2%	2%	2%
Turn Type			Free			Free	Prot		custom			
Protected Phases		2			6		8					
Permitted Phases			Free			Free			8			
Actuated Green, G (s)		27.2	51.1		27.2	51.1	13.8		13.8			
Effective Green, g (s)		28.1	51.1		28.1	51.1	15.0		15.0			
Actuated g/C Ratio		0.55	1.00		0.55	1.00	0.29		0.29			
Clearance Time (s)		4.9			4.9		5.2		5.2			
Vehicle Extension (s)		5.7			5.7		5.3		5.3			
Lane Grp Cap (vph)		2575	1335		2796	1550	514		451			
v/s Ratio Prot		0.36			0.16		0.12					
v/s Ratio Perm			0.74			0.32			0.10			
v/c Ratio		0.65	0.74		0.29	0.32	0.41		0.34			
Uniform Delay, d1		8.1	0.0		6.1	0.0	14.5		14.2			
Progression Factor		1.00	1.00		1.00	1.00	1.00		1.00			
Incremental Delay, d2		0.9	3.8		0.1	0.6	1.2		1.0			
Delay (s)		9.0	3.8		6.3	0.6	15.7		15.2			
Level of Service		A	A		A	A	B		B			
Approach Delay (s)		7.1			4.1		15.5				0.0	
Approach LOS		A			A		B				A	
Intersection Summary												
HCM Average Control Delay			6.9				HCM Level of Service		A			
HCM Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			51.1				Sum of lost time (s)		0.0			
Intersection Capacity Utilization			51.6%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

PM Peak Hour
Existing Conditions

Synchro 6 Report
11/30/2010

HCM Signalized Intersection Capacity Analysis
72: White Lane & Hughes Lane

PM Peak Hour
Existing Conditions



Movement	SBU	SBL	SBT	SBR
Lane Configurations		LT	LT	
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	
Lane Util. Factor		1.00	0.95	
Frpb, ped/bikes		1.00	0.99	
Flpb, ped/bikes		1.00	1.00	
Frt		1.00	0.94	
Flt Protected		0.95	1.00	
Satd. Flow (prot)		1770	3306	
Flt Permitted		0.95	1.00	
Satd. Flow (perm)		1770	3306	
Volume (vph)	6	125	191	129
Peak-hour factor, PHF	0.80	0.80	0.80	0.80
Adj. Flow (vph)	8	156	239	161
RTOR Reduction (vph)	0	0	0	0
Lane Group Flow (vph)	0	164	400	0
Confl. Peds. (#/hr)				2
Turn Type	Prot	Prot		
Protected Phases	7	7	4	
Permitted Phases				
Actuated Green, G (s)		23.3	17.1	
Effective Green, g (s)		23.3	18.4	
Actuated g/C Ratio		0.22	0.17	
Clearance Time (s)		4.0	5.3	
Vehicle Extension (s)		1.0	2.0	
Lane Grp Cap (vph)		382	563	
v/s Ratio Prot		0.09	0.12	
v/s Ratio Perm				
v/c Ratio		0.43	0.71	
Uniform Delay, d1		36.6	42.3	
Progression Factor		1.00	1.00	
Incremental Delay, d2		0.3	3.5	
Delay (s)		36.9	45.8	
Level of Service		D	D	
Approach Delay (s)			43.2	
Approach LOS			D	
Intersection Summary				

INTEROFFICE CORRESPONDENCE

HNTB

To

Steven McDonald (Caltrans)
KoKo Widyatmoko (Caltrans)

From

Jose Mortero

Cc

Bob Scales (TRIP/Parsons)
Rabindra Puttagunta (TRIP/Parsons)
David Woo
Luis Porello

Subject

Centennial Corridor Project
Existing Truck Volumes & Percentages

Date

April 21, 2009

This memo describes the data, assumptions and approach used to develop existing truck volumes on State Route (SR) 58 and SR 99 mainline segments and ramps for the Centennial Corridor Project. It also presents the recommended truck volumes and percentages to be used for existing conditions analysis. Future truck volumes and percentages to be used for opening year and design year analyses will be documented in a separate memo.

Tables 1 to 3 show the existing peak hour truck volumes and percentages recommended for use in the existing conditions analysis. The Total Volumes are based on existing count information, adjusted to reflect balanced volumes between freeway mainline segments and ramps. The truck volumes were derived from truck count data collected for the SR 58 Truck O&D Study (hereinafter referred to as the KOA Study).¹ The KOA Study collected truck counts at SR 99 / SR 58 system interchange ramps as well as at the SR 99 Rosedale interchange ramps in Spring and Fall 2008. Truck counts were collected for the KOA Study for the AM (6-9 AM), midday (11 AM – 2 PM), and PM (4-7 PM) peak periods. Counts were recorded by 15-minute intervals. HNTB tabulated the truck count data by 15-minute intervals and summarized the data by 60-minute running totals. Attachment A shows the tabulated and summarized truck count data.

Based on the tabulated truck count data, 7-8 AM and 4-5 PM were determined to be the peak hours for truck operations. The data also showed that peak hour truck volumes were generally higher in Fall than in

¹ KOA, *SR 58 Origin and Destination Truck Study Draft Report*, January 26, 2009.

Spring. The Spring counts also have missing count data. For these reasons, the Fall 2008 data was used for deriving the peak hour truck volumes for analysis.

Based on available peak hour ramp vehicle classification counts provided by TRIP for SR 99 interchanges at Olive Drive and Airport Drive, the following peak hour truck percentage assumptions were used for interchanges within the Centennial Corridor project study area:

- Ming Avenue, California Avenue and Airport Drive – 8 percent trucks. These interchanges are located in predominantly commercial / industrial areas expected to generate significant amount of truck traffic.
- White Lane, H Street, Chester Avenue and Union Avenue – 6 percent trucks. These interchanges are located in predominantly residential areas that are expected to generate less truck traffic.

Peak hour truck volumes on these ramps were calculated by applying the peak hour truck percentage assumption to the total ramp volumes.

Truck volumes for the SR 99 / SR 58 system interchange ramps as well as for the SR 99 / Rosedale Highway interchange ramps were derived from the KOA Study as described above, and were used as control totals. Truck volumes for the SR 99 and SR 58 mainline freeway segments in the immediate vicinity of the system interchange were calculated from the system interchange ramp volumes. Truck volumes for mainline freeway segments outside of the vicinity of the system interchange ramps were calculated by working from the control totals, and adding/subtracting the on/off-ramp truck volumes.

CENTENNIAL CORRIDOR PROJECT
EXISTING VOLUMES (2007/2008)

TABLE 1

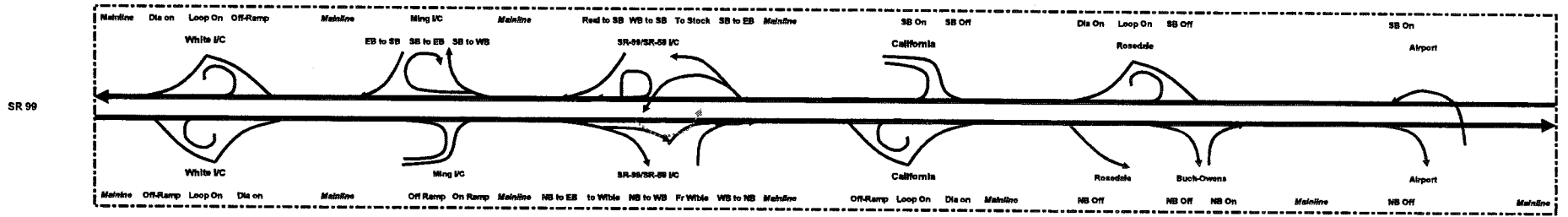
LOCATION	EXISTING (2007/2008) COUNTS							
	AM Peak				PM Peak			
	Cars	Trucks	Total Volume	Truck %	Cars	Trucks	Total Volume	Truck %
<u>SR-99 Mainline NB (North of Airport)</u>	1,292	722	2,014	36%	1,991	483	2,476	20%
SR 99 Airport NB Off	1,383	120	1,503	8%	1,104	96	1,200	8%
<u>SR-99 Mainline NB (Bet. Rosedale & Airport)</u>	2,674	843	3,517	24%	3,085	581	3,676	16%
SR 99 Buck-Owens NB On	224	42	266	16%	527	5	532	1%
SR 99 Buck-Owens NB Off	671	28	699	4%	213	63	276	23%
SR 99 Rosedale NB Off	1,633	97	1,730	6%	1,068	92	1,160	5%
<u>SR-99 Mainline NB (Bet. California & Rosedale)</u>	4,754	928	5,682	16%	4,449	731	5,180	14%
SR 99 California NB On (Diagonal)	236	21	257	8%	196	17	213	8%
SR 99 California NB On (Loop)	431	38	469	8%	579	50	629	8%
SR 99 California NB Off	972	84	1,056	8%	624	54	678	8%
<u>SR-99 Mainline NB (Bet. SR-58 & California)</u>	5,058	952	6,010	16%	4,298	718	5,016	14%
SR 99 NB On from SR-58 WB	811	277	1,088	25%	793	291	1,084	27%
SR 99 NB Off to SR-58 EB	1,355	158	1,511	10%	1,092	97	1,189	8%
SR 99 NB On from Wible	505	0	505	0%	555	0	555	0%
SR 99 NB Off to Wible Road	248	0	248	0%	268	0	268	0%
<u>SR-99 Mainline NB (Bet. Ming & SR-58)</u>	5,345	831	6,176	13%	4,310	524	4,834	11%
SR 99 Ming NB On (Diagonal)	1,181	103	1,284	8%	1,134	99	1,233	8%
SR 99 Ming NB Off	282	24	306	8%	374	32	406	8%
<u>SR-99 Mainline NB (Bet. White & Ming)</u>	4,443	753	5,196	14%	3,549	458	4,007	11%
SR 99 White NB On (Diagonal)	840	41	881	6%	430	27	457	6%
SR 99 White NB On (Loop)	1,434	92	1,525	6%	1,088	69	1,155	6%
SR 99 White NB Off	192	12	204	6%	318	20	338	6%
<u>SR-99 Mainline NB (South of White)</u>	2,561	633	3,194	20%	2,352	381	2,733	14%
<u>SR-99 Mainline SB (North of Airport)</u>	1,447	827	2,074	30%	2,418	734	3,150	23%
SR 99 Airport SB On	1,020	89	1,109	8%	1,513	132	1,645	8%
<u>SR-99 Mainline SB (Bet. Airport & Rosedale)</u>	2,467	716	3,183	22%	3,829	866	4,795	18%
SR 99 Rosedale SB Off	541	44	585	8%	598	35	633	6%
SR 99 Rosedale SB On (Loop)	595	103	698	15%	1,241	26	1,267	2%
SR 99 Rosedale SB On (Diagonal)	810	107	917	12%	1,075	116	1,191	10%
<u>SR-99 Mainline SB (Bet. Rosedale & California)</u>	3,331	882	4,213	21%	5,647	873	6,520	13%
SR 99 California SB Off	908	79	987	8%	945	82	1,027	8%
SR 99 California SB On (loop)	293	25	318	8%	777	68	845	8%
<u>SR-99 Mainline SB (Bet. California & SR-58)</u>	2,716	828	3,544	23%	5,480	858	6,338	13%
SR 99 SB Off to SR-58 EB	869	227	1,096	21%	1,102	348	1,450	24%
SR 99 SB On from SR-58 WB	797	136	933	15%	1,112	12	1,124	1%
SR 99 SB Off to Stockdale Hwy	349	0	349	0%	446	0	446	0%
SR 99 SB On from Real Road	243	12	255	5%	252	19	271	7%
<u>SR-99 Mainline SB (Bet. SR-58 & Ming)</u>	2,571	716	3,287	22%	5,234	703	5,937	13%
SR 99 Ming SB Off to WB & EB	729	83	792	8%	1,432	125	1,557	8%
SR 99 Ming SB Off to WB	470	41	511	8%	805	70	875	8%
SR 99 Ming SB Off to EB	259	22	281	8%	627	55	682	8%
SR 99 Ming SB On (Diagonal)	224	20	244	8%	421	37	458	8%
<u>SR-99 Mainline SB (Bet. Ming & White)</u>	2,130	809	2,939	22%	4,347	481	4,828	10%
SR 99 White SB Off	1,285	82	1,367	6%	1,898	121	2,019	6%
SR 99 White SB On (Loop)	101	6	107	6%	124	8	132	6%
SR 99 White SB On (Diagonal)	132	8	140	6%	125	8	133	6%
<u>SR-99 Mainline SB (South of White)</u>	1,077	542	1,619	33%	2,699	385	3,084	12%
<u>SR-58 Mainline EB (Bet. Real Road & Off Ramp to SR-99 SB)</u>	1,150	51	1,201	4%	1,004	72	1,076	7%
Real Road Off to 99 SB	243	12	255	5%	252	19	271	7%
SR 58 On Ramp from 99 SB	889	227	1,096	21%	1,102	348	1,450	24%
SR 58 On Ramp from 99 NB	1,355	158	1,511	10%	1,092	97	1,189	8%
<u>SR-58 Mainline EB (Bet. SR-99 after ramps & H Street)</u>	3,131	422	3,553	12%	2,946	498	3,444	14%
SR 58 H Street EB Off	385	25	410	6%	376	24	400	6%
SR 58 Chester EB On	445	28	473	6%	527	34	561	6%
<u>SR-58 Mainline EB (Bet. H Street & Union)</u>	3,180	426	3,616	12%	3,097	508	3,605	14%
SR 58 Union EB Off Ramp	775	49	824	6%	528	34	562	6%
SR 58 Union EB On Ramp (Loop)	163	10	173	6%	211	13	224	6%
SR 58 Union EB On Ramp (Diagonal)	185	12	197	6%	224	14	238	6%
<u>SR-58 Mainline EB (Bet. Union & Cottonwood)</u>	2,763	399	3,162	13%	3,003	502	3,505	14%
<u>SR-58 Mainline WB (Bet. Cottonwood & Union)</u>	2,688	456	3,144	15%	2,632	415	3,047	14%
SR 58 Brundage WB Off Ramp	465	30	495	6%	317	20	337	6%
SR 58 Brundage WB On Ramp	175	11	186	6%	228	15	243	6%
SR 58 Union WB On Ramp	227	14	241	6%	333	21	354	6%
<u>SR-58 Mainline WB (Bet. Union & H Street)</u>	2,616	480	3,078	15%	2,907	400	3,307	12%
SR 58 Chester WB Off	431	28	459	6%	429	27	456	6%
SR 58 H Street WB On	313	20	333	6%	437	28	465	6%
<u>SR-58 Mainline WB (Bet. H Street & SR-99)</u>	2,482	468	2,950	16%	2,817	399	3,316	12%
SR 58 WB Off to SR-99 NB	811	277	1,088	25%	793	291	1,084	27%
SR 58 WB Off to SR-99 SB	797	136	933	15%	1,112	12	1,124	1%
<u>SR-58 Mainline WB (Bet. Real Road & SR-99 SB On)</u>	841	88	929	9%	1,074	34	1,108	3%

Control numbers from KOA O-D Study (Fall Data)

Table 2
CENTENNIAL CORRIDOR PROJECT
EXISTING FREEWAY AND RAMP VOLUMES - SR 99

Existing																									
AM	Cars	1,077	132	101	1,285	2,130	224	239	470	2,571	243	797	348	869	2,718	283	908	3,331	810	595	541		2,467	1,020	1,447
	Trucks	542	8	8	82	609	20	22	41	716	12	136	0	227	828	25	79	882	107	103	44		716	89	627
	Total	1,619	140	107	1,367	2,739	244	261	511	3,287	255	933	348	1,096	3,544	318	987	4,213	917	698	585		3,183	1,109	2,074
PM	Cars	2,599	125	124	1,898	4,367	421	627	805	5,234	232	1,112	448	1,192	5,480	777	945	5,637	1,073	1,241	598		3,925	1,513	2,619
	Trucks	385	8	8	121	491	37	55	70	703	19	12	0	348	958	68	82	973	116	26	38		856	132	794
	Total	3,034	133	132	2,019	4,858	458	682	875	5,937	271	1,124	448	1,490	6,438	845	1,027	6,620	1,191	1,267	633		4,781	1,645	3,413

SOUTHBOUND



NORTHBOUND

Existing																									
AM	Cars	2,561	192	1,434	640	4,443	282	1,181	5,345	1,355	248	505	811	5,058	972	431	238	4,754	1,833	971	224		2,674	1,383	1,292
	Trucks	633	12	92	41	753	24	103	831	156	0	0	277	952	84	38	21	926	97	28	42		843	120	722
	Total	3,194	204	1,525	681	5,196	306	1,284	6,176	1,511	248	505	1,088	6,010	1,056	469	257	5,680	1,730	999	266		3,517	1,503	2,014
PM	Cars	2,552	318	1,086	430	3,589	374	1,134	4,310	1,092	288	555	793	4,293	624	579	196	4,449	1,688	213	527		3,695	1,104	1,251
	Trucks	391	20	89	27	459	32	99	524	97	0	0	291	718	54	50	17	731	92	63	5		551	96	425
	Total	2,733	338	1,155	457	4,097	406	1,233	4,834	1,189	288	555	1,084	5,018	678	629	213	5,180	1,780	276	532		4,246	1,200	1,676

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SR 68 / WSP

AM

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ATTACHMENT A

**CENTENNIAL CORRIDOR PROJECT
EXISTING TRUCK VOLUMES AND PERCENTAGES
AT SR-58 AND SR-99
SUMMARY AND RECOMMENDATIONS**

Location		Season	Existing Data From KOA Study								Recommendations			
			AM Peak Hour (7-8 AM)				PM Peak Hour (4-5 PM)				AM Peak Hour		PM Peak Hour	
			Cars	Trucks	Total	% Trucks	Cars	Trucks	Total	% Trucks	Truck Vol.	Truck %	Truck Vol.	Truck %
SR 99 / SR 58 Connectors	SR 99 NB Connector to SR 58 EB	Fall	904	156	1,060	15%	945	97	1,042	9%	156	15%	97	9%
		Spring	1,273	119	1,392	9%	1,024	99	1,123	9%				
	SR 58 WB Connector to SR 99 NB	Fall	763	277	1,040	27%	715	291	1,006	29%	277	27%	291	29%
		Spring	855	261	1,116	23%	1,514	234	1,748	13%				
	SR 99 SB Connector to SR 58 EB	Fall	719	227	946	24%	1,037	348	1,385	25%	227	24%	348	25%
		Spring	NA	NA	NA	NA	NA	NA	NA	NA				
	SR 58 WB Connector to SR 99 SB	Fall	589	136	725	19%	182	12	194	6%	136	19%	12	6%
		Spring	NA	NA	NA	NA	NA	NA	NA	NA				
	SR 58 EB Connector to SR 99 SB	Fall	157	12	169	7%	226	19	245	8%	12	7%	19	8%
		Spring	NA	NA	NA	NA	NA	NA	NA	NA				
SR 99 Mainline	SR 99 NB Mainline s/o SR 58	Fall	6,016	831	6,847	12%	4,249	524	4,773	11%	831	12%	524	11%
		Spring	5,638	574	6,212	9%	4,399	453	4,852	9%				
	SR 99 SB Mainline s/o SR 58	Fall	2,738	716	3,454	21%	3,942	703	4,645	15%	716	21%	703	15%
		Spring	NA	NA	NA	NA	NA	NA	NA	NA				
	SR 99 NB Mainline n/o SR 58	Fall	5,875	952	6,827	14%	4,019	718	4,737	15%	952	14%	718	15%
		Spring	5,220	716	5,936	12%	4,889	588	5,477	11%				
	SR 99 SB Mainline n/o SR 58	Fall	2,550	828	3,378	25%	3,679	958	4,637	21%	828	25%	958	21%
		Spring	NA	NA	NA	NA	NA	NA	NA	NA				
SR 58 Mainline	SR 58 EB Mainline e/o SR 99	Fall	2,454	422	2,876	15%	2,695	498	3,193	16%	422	15%	498	16%
		Spring	NA	NA	NA	NA	NA	NA	NA	NA				
	SR 58 WB Mainline e/o SR 99	Fall	2,248	468	2,716	17%	2,891	399	3,290	12%	468	17%	399	12%
		Spring	NA	NA	NA	NA	NA	NA	NA	NA				
	SR 58 EB Mainline w/o SR 99	Fall	988	51	1,039	5%	939	72	1,011	7%	51	5%	72	7%
		Spring	NA	NA	NA	NA	NA	NA	NA	NA				
	SR 58 WB Mainline w/o SR 99	Fall	735	88	823	11%	1,102	34	1,136	3%	88	11%	34	3%
		Spring	1,234	115	1,349	9%	1,751	84	1,835	5%				
Rosedale I/C Ramps	SR 99 NB Off-Ramp at Rosedale	Fall	1,151	97	1,248	8%	1,484	92	1,576	6%	97	8%	92	6%
		Spring	1,090	90	1,180	8%	1,185	108	1,293	8%				
	SR 99 NB Off-Ramp at Buck Owens	Fall	497	28	525	5%	293	63	356	18%	28	5%	63	18%
		Spring	511	52	563	9%	234	42	276	15%				
	SR 99 NB On-Ramp at Buck Owens	Fall	255	42	297	14%	520	5	525	1%	42	14%	5	1%
		Spring	220	49	269	18%	387	40	427	9%				
	SR 99 SB Off-Ramp at Rosedale	Fall	209	44	253	17%	411	35	446	8%	44	17%	35	8%
		Spring	315	34	349	10%	423	32	455	7%				
	SR 99 SB On-Ramp at Rosedale (Diagonal)	Fall	383	107	490	22%	786	116	902	13%	107	22%	116	13%
		Spring	654	90	744	12%	1,030	80	1,110	7%				
	SR 99 SB On-Ramp at Rosedale (Loop)	Fall	275	103	378	27%	727	26	753	3%	103	27%	26	3%
		Spring	556	48	604	8%	843	47	890	5%				

Source: Parsons/HNTB analysis of data from KOA, Draft Report for SR-58 Origin and Destination Truck Study, January 26, 2009.

Note: Recommendations based on Fall data due to generally higher volumes as well as incomplete Spring data.

NA - Count data not available.

SR 99 / SR 58
SYSTEM INTERCHANGE RAMPS

**CENTENNIAL CORRIDOR PROJECT
EXISTING TRUCK VOLUMES AND PERCENTAGES
AT SR-58 / SR-99 SYSTEM INTERCHANGE RAMP**

NBR-SR 99 NB to SR 58 EB - Spring "SR-99 NB off-ramp connector to SR-58 EB"

AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	116	29	145		16:00-16:15	275	19	294	
6:15-6:30	147	25	172		16:15-16:30	268	27	295	
6:30-6:45	202	24	226		16:30-16:45	250	31	281	
6:45-7:00	245	30	275		16:45-17:00	231	22	253	
7:00-7:15	239	23	262		17:00-17:15	255	28	283	
7:15-7:30	315	25	340		17:15-17:30	236	17	253	
7:30-7:45	348	33	381		17:30-17:45	236	22	258	
7:45-8:00	371	38	409		17:45-18:00	252	17	269	
8:00-8:15	298	38	336		18:00-18:15	222	21	243	
8:15-8:30	269	31	300		18:15-18:30	203	16	219	
8:30-8:45	195	25	220		18:30-18:45	204	22	226	
8:45-9:00	206	25	231		18:45-19:00	190	17	207	
<hr/>					<hr/>				
6:00-7:00	710	108	818	13%	16:00-17:00	1,024	99	1,123	9%
6:15-7:15	833	102	935	11%	16:15-17:15	1,004	108	1,112	10%
6:30-7:30	1,001	102	1,103	9%	16:30-17:30	972	98	1,070	9%
6:45-7:45	1,147	111	1,258	9%	16:45-17:45	958	89	1,047	9%
7:00-8:00	1,273	119	1,392	9%	17:00-18:00	979	84	1,063	8%
7:15-8:15	1,332	134	1,466	9%	17:15-18:15	946	77	1,023	8%
7:30-8:30	1,286	140	1,426	10%	17:30-18:30	913	76	989	8%
7:45-8:45	1,133	132	1,265	10%	17:45-18:45	881	76	957	8%
8:00-9:00	988	119	1,087	11%	18:00-19:00	819	76	895	8%
Total	2,951	346	3,297	10%	Total	2,822	259	3,081	8%

NBR-SR 99 NB to SR 58 EB - Fall "SR-99 NB Off-Ramp Connector SR-58"

AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	220	38	258		16:00-16:15	245	30	275	
6:15-6:30	281	37	318		16:15-16:30	246	22	268	
6:30-6:45	307	28	335		16:30-16:45	238	20	258	
6:45-7:00	369	43	412		16:45-17:00	216	25	241	
7:00-7:15	319	39	358		17:00-17:15	230	27	257	
7:15-7:30	228	51	279		17:15-17:30	248	22	270	
7:30-7:45	182	36	218		17:30-17:45	269	25	294	
7:45-8:00	175	30	205		17:45-18:00	265	19	284	
8:00-8:15	103	20	123		18:00-18:15	202	19	221	
8:15-8:30	120	17	137		18:15-18:30	210	17	227	
8:30-8:45	180	25	205		18:30-18:45	148	10	158	
8:45-9:00	222	47	269		18:45-19:00	184	10	194	
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6:00-7:00	1,177	146	1,323	11%	16:00-17:00	945	97	1,042	9%
6:15-7:15	1,276	147	1,423	10%	16:15-17:15	930	94	1,024	9%
6:30-7:30	1,223	161	1,384	12%	16:30-17:30	932	94	1,026	9%
6:45-7:45	1,098	169	1,267	13%	16:45-17:45	963	99	1,062	9%
7:00-8:00	904	156	1,060	15%	17:00-18:00	1,012	93	1,105	8%
7:15-8:15	688	137	825	17%	17:15-18:15	984	85	1,069	8%
7:30-8:30	580	103	683	15%	17:30-18:30	946	80	1,026	8%
7:45-8:45	578	92	670	14%	17:45-18:45	825	65	890	7%
8:00-9:00	625	109	734	15%	18:00-19:00	744	56	800	7%
Total	2,706	411	3,117	13%	Total	2,701	246	2,947	8%

WBR-SR 58 WB to SR 99 NB - Spring "SR-58 off ramp connector to SR-99 NB"

AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	159	49	208		16:00-16:15	314	45	359	
6:15-6:30	160	58	218		16:15-16:30	545	93	638	
6:30-6:45	246	57	303		16:30-16:45	238	58	296	
6:45-7:00	209	57	266		16:45-17:00	417	38	455	
7:00-7:15	160	67	227		17:00-17:15	187	43	230	
7:15-7:30	179	57	236		17:15-17:30	298	69	367	
7:30-7:45	241	74	315		17:30-17:45	211	57	268	
7:45-8:00	275	63	338		17:45-18:00	165	42	207	
8:00-8:15	171	64	235		18:00-18:15	178	43	221	
8:15-8:30	187	59	246		18:15-18:30	145	54	199	
8:30-8:45	155	76	231		18:30-18:45	155	44	199	
8:45-9:00	157	73	230		18:45-19:00	123	54	177	
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6:00-7:00	774	221	995	22%	16:00-17:00	1,514	234	1,748	13%
6:15-7:15	775	239	1,014	24%	16:15-17:15	1,387	232	1,619	14%
6:30-7:30	794	238	1,032	23%	16:30-17:30	1,140	208	1,348	15%
6:45-7:45	789	255	1,044	24%	16:45-17:45	1,113	207	1,320	16%
7:00-8:00	855	261	1,116	23%	17:00-18:00	861	211	1,072	20%
7:15-8:15	866	258	1,124	23%	17:15-18:15	852	211	1,063	20%
7:30-8:30	874	260	1,134	23%	17:30-18:30	699	196	895	22%
7:45-8:45	788	262	1,050	25%	17:45-18:45	643	183	826	22%
8:00-9:00	670	272	942	29%	18:00-19:00	601	195	796	24%
Total	2,299	754	3,053	25%	Total	2,976	640	3,616	18%

WBR-SR 58 WB to SR 99 NB - Fall "SR-99 NB n/o Stockdale Hwy SR-58 Off-Ramp Connector"

AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	276	48	324		16:00-16:15	124	67	191	
6:15-6:30	239	47	286		16:15-16:30	199	76	275	
6:30-6:45	237	60	297		16:30-16:45	185	69	254	
6:45-7:00	225	84	309		16:45-17:00	207	79	286	
7:00-7:15	155	56	211		17:00-17:15	214	41	255	
7:15-7:30	146	71	217		17:15-17:30	213	39	252	
7:30-7:45	217	80	297		17:30-17:45	169	41	210	
7:45-8:00	245	70	315		17:45-18:00	168	47	215	
8:00-8:15	151	87	238		18:00-18:15	147	44	191	
8:15-8:30	171	74	245		18:15-18:30	134	60	194	
8:30-8:45	122	75	197		18:30-18:45	132	39	171	
8:45-9:00	136	75	211		18:45-19:00	118	44	162	
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6:00-7:00	977	239	1,216	20%	16:00-17:00	715	291	1,006	29%
6:15-7:15	856	247	1,103	22%	16:15-17:15	805	265	1,070	25%
6:30-7:30	763	271	1,034	26%	16:30-17:30	819	228	1,047	22%
6:45-7:45	743	291	1,034	28%	16:45-17:45	803	200	1,003	20%
7:00-8:00	763	277	1,040	27%	17:00-18:00	784	168	932	18%
7:15-8:15	759	308	1,067	29%	17:15-18:15	697	171	868	20%
7:30-8:30	784	311	1,095	28%	17:30-18:30	618	192	810	24%
7:45-8:45	689	306	995	31%	17:45-18:45	581	190	771	25%
8:00-9:00	580	311	891	35%	18:00-19:00	531	187	718	26%
Total	2,320	827	3,147	26%	Total	2,010	646	2,656	24%

**CENTENNIAL CORRIDOR PROJECT
EXISTING TRUCK VOLUMES AND PERCENTAGES
AT SR-58 / SR-99 SYSTEM INTERCHANGE RAMP**

SBL-SR 99 SB to SR 58 EB - Spring "NA"

AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	NA	NA	NA		16:00-16:15	NA	NA	NA	
6:15-6:30	NA	NA	NA		16:15-16:30	NA	NA	NA	
6:30-6:45	NA	NA	NA		16:30-16:45	NA	NA	NA	
6:45-7:00	NA	NA	NA		16:45-17:00	NA	NA	NA	
7:00-7:15	NA	NA	NA		17:00-17:15	NA	NA	NA	
7:15-7:30	NA	NA	NA		17:15-17:30	NA	NA	NA	
7:30-7:45	NA	NA	NA		17:30-17:45	NA	NA	NA	
7:45-8:00	NA	NA	NA		17:45-18:00	NA	NA	NA	
8:00-8:15	NA	NA	NA		18:00-18:15	NA	NA	NA	
8:15-8:30	NA	NA	NA		18:15-18:30	NA	NA	NA	
8:30-8:45	NA	NA	NA		18:30-18:45	NA	NA	NA	
8:45-9:00	NA	NA	NA		18:45-19:00	NA	NA	NA	
<hr/>					<hr/>				
6:00-7:00	NA	NA	NA	NA	16:00-17:00	NA	NA	NA	NA
6:15-7:15	NA	NA	NA	NA	16:15-17:15	NA	NA	NA	NA
6:30-7:30	NA	NA	NA	NA	16:30-17:30	NA	NA	NA	NA
6:45-7:45	NA	NA	NA	NA	16:45-17:45	NA	NA	NA	NA
7:00-8:00	NA	NA	NA	NA	17:00-18:00	NA	NA	NA	NA
7:15-8:15	NA	NA	NA	NA	17:15-18:15	NA	NA	NA	NA
7:30-8:30	NA	NA	NA	NA	17:30-18:30	NA	NA	NA	NA
7:45-8:45	NA	NA	NA	NA	17:45-18:45	NA	NA	NA	NA
8:00-9:00	NA	NA	NA	NA	18:00-19:00	NA	NA	NA	NA
Total	NA	NA	NA	NA	Total	NA	NA	NA	NA

WBL-SR 58 WB to SR 99 SB - Spring "NA"

AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	NA	NA	NA		16:00-16:15	NA	NA	NA	
6:15-6:30	NA	NA	NA		16:15-16:30	NA	NA	NA	
6:30-6:45	NA	NA	NA		16:30-16:45	NA	NA	NA	
6:45-7:00	NA	NA	NA		16:45-17:00	NA	NA	NA	
7:00-7:15	NA	NA	NA		17:00-17:15	NA	NA	NA	
7:15-7:30	NA	NA	NA		17:15-17:30	NA	NA	NA	
7:30-7:45	NA	NA	NA		17:30-17:45	NA	NA	NA	
7:45-8:00	NA	NA	NA		17:45-18:00	NA	NA	NA	
8:00-8:15	NA	NA	NA		18:00-18:15	NA	NA	NA	
8:15-8:30	NA	NA	NA		18:15-18:30	NA	NA	NA	
8:30-8:45	NA	NA	NA		18:30-18:45	NA	NA	NA	
8:45-9:00	NA	NA	NA		18:45-19:00	NA	NA	NA	
<hr/>					<hr/>				
6:00-7:00	NA	NA	NA	NA	16:00-17:00	NA	NA	NA	NA
6:15-7:15	NA	NA	NA	NA	16:15-17:15	NA	NA	NA	NA
6:30-7:30	NA	NA	NA	NA	16:30-17:30	NA	NA	NA	NA
6:45-7:45	NA	NA	NA	NA	16:45-17:45	NA	NA	NA	NA
7:00-8:00	NA	NA	NA	NA	17:00-18:00	NA	NA	NA	NA
7:15-8:15	NA	NA	NA	NA	17:15-18:15	NA	NA	NA	NA
7:30-8:30	NA	NA	NA	NA	17:30-18:30	NA	NA	NA	NA
7:45-8:45	NA	NA	NA	NA	17:45-18:45	NA	NA	NA	NA
8:00-9:00	NA	NA	NA	NA	18:00-19:00	NA	NA	NA	NA
Total	NA	NA	NA	NA	Total	NA	NA	NA	NA

SBL-SR 99 SB to SR 58 EB - Fall "SR-99 SB Off-Ramp SR-58 EB"

AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	102	39	141		16:00-16:15	287	97	384	
6:15-6:30	119	44	163		16:15-16:30	239	92	331	
6:30-6:45	116	69	185		16:30-16:45	262	72	334	
6:45-7:00	184	58	242		16:45-17:00	249	87	336	
7:00-7:15	155	52	207		17:00-17:15	186	66	252	
7:15-7:30	190	50	240		17:15-17:30	242	72	314	
7:30-7:45	162	64	226		17:30-17:45	182	77	259	
7:45-8:00	212	61	273		17:45-18:00	187	70	257	
8:00-8:15	158	63	221		18:00-18:15	154	84	238	
8:15-8:30	136	67	203		18:15-18:30	123	88	211	
8:30-8:45	136	67	203		18:30-18:45	121	85	206	
8:45-9:00	138	73	211		18:45-19:00	111	74	185	
<hr/>					<hr/>				
6:00-7:00	521	210	731	29%	16:00-17:00	1,037	348	1,385	25%
6:15-7:15	574	223	797	28%	16:15-17:15	936	317	1,253	25%
6:30-7:30	645	229	874	26%	16:30-17:30	939	297	1,236	24%
6:45-7:45	691	224	915	24%	16:45-17:45	859	302	1,161	26%
7:00-8:00	719	227	946	24%	17:00-18:00	797	285	1,082	26%
7:15-8:15	722	238	960	25%	17:15-18:15	765	303	1,068	28%
7:30-8:30	868	255	923	28%	17:30-18:30	846	319	965	33%
7:45-8:45	642	258	900	29%	17:45-18:45	585	327	912	36%
8:00-9:00	568	270	838	32%	18:00-19:00	509	331	840	39%
Total	1,808	707	2,515	28%	Total	2,343	964	3,307	29%

WBL-SR 58 WB to SR 99 SB - Fall "SR-99 SB Off-Ramp SR-58 WB Off-Ramp"

AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	185	33	218		16:00-16:15	271	16	287	
6:15-6:30	162	37	199		16:15-16:30	260	25	285	
6:30-6:45	157	39	196		16:30-16:45	272	15	287	
6:45-7:00	145	52	197		16:45-17:00	271	18	289	
7:00-7:15	138	25	163		17:00-17:15	271	28	299	
7:15-7:30	149	20	169		17:15-17:30	319	11	330	
7:30-7:45	216	32	248		17:30-17:45	321	26	347	
7:45-8:00	247	26	273		17:45-18:00	268	18	286	
8:00-8:15	163	22	185		18:00-18:15	205	7	212	
8:15-8:30	161	28	189		18:15-18:30	211	19	230	
8:30-8:45	151	20	171		18:30-18:45	182	12	194	
8:45-9:00	147	22	169		18:45-19:00	45	5	50	
<hr/>					<hr/>				
6:00-7:00	649	161	810	20%	16:00-17:00	1,074	74	1,148	6%
6:15-7:15	602	153	755	20%	16:15-17:15	1,074	86	1,160	7%
6:30-7:30	589	136	725	19%	16:30-17:30	1,133	72	1,205	6%
6:45-7:45	648	129	777	17%	16:45-17:45	1,182	83	1,265	7%
7:00-8:00	750	103	853	12%	17:00-18:00	1,179	83	1,262	7%
7:15-8:15	775	100	875	11%	17:15-18:15	1,113	62	1,175	5%
7:30-8:30	787	108	895	12%	17:30-18:30	1,005	70	1,075	7%
7:45-8:45	722	96	818	12%	17:45-18:45	866	56	922	6%
8:00-9:00	622	92	714	13%	18:00-19:00	643	43	686	6%
Total	2,021	356	2,377	15%	Total	2,896	200	3,096	6%

**CENTENNIAL CORRIDOR PROJECT
EXISTING TRUCK VOLUMES AND PERCENTAGES
AT SR-58 / SR-99 SYSTEM INTERCHANGE RAMP**

NBT-SR 99 NB- Spring "SR-99 NB n/o Stockdale Hwy"

AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	494	90	584		16:00-16:15	884	90	974	
6:15-6:30	393	65	458		16:15-16:30	797	88	885	
6:30-6:45	1,077	143	1,220		16:30-16:45	870	75	945	
6:45-7:00	684	200	884		16:45-17:00	824	101	925	
7:00-7:15	910	97	1,007		17:00-17:15	905	107	1,012	
7:15-7:30	1,044	116	1,160		17:15-17:30	792	74	866	
7:30-7:45	1,129	102	1,231		17:30-17:45	818	104	922	
7:45-8:00	1,282	140	1,422		17:45-18:00	739	89	828	
8:00-8:15	869	135	1,004		18:00-18:15	733	85	818	
8:15-8:30	839	145	984		18:15-18:30	674	96	770	
8:30-8:45	715	98	813		18:30-18:45	598	83	681	
8:45-9:00	711	98	809		18:45-19:00	608	85	693	
<hr/>					<hr/>				
6:00-7:00	2,648	498	3,146	16%	16:00-17:00	3,375	354	3,729	9%
6:15-7:15	3,064	505	3,569	14%	16:15-17:15	3,396	371	3,767	10%
6:30-7:30	3,715	556	4,271	13%	16:30-17:30	3,391	357	3,748	10%
6:45-7:45	3,767	515	4,282	12%	16:45-17:45	3,339	386	3,725	10%
7:00-8:00	4,365	455	4,820	9%	17:00-18:00	3,254	374	3,628	10%
7:15-8:15	4,324	493	4,817	10%	17:15-18:15	3,082	352	3,434	10%
7:30-8:30	4,119	522	4,641	11%	17:30-18:30	2,964	374	3,338	11%
7:45-8:45	3,705	518	4,223	12%	17:45-18:45	2,744	353	3,097	11%
8:00-9:00	3,134	476	3,610	13%	18:00-19:00	2,613	349	2,962	12%
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Total	10,147	1,429	11,576	12%	Total	9,242	1,077	10,319	10%

SBT-SR 99 - Spring "SR-99 n/o Stockdale Hwy"

AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	308	76	384		16:00-16:15	905	117	1,022	
6:15-6:30	266	65	331		16:15-16:30	923	126	1,049	
6:30-6:45	364	96	460		16:30-16:45	917	114	1,031	
6:45-7:00	364	91	455		16:45-17:00	945	137	1,082	
7:00-7:15	363	68	431		17:00-17:15	1,044	132	1,176	
7:15-7:30	421	97	518		17:15-17:30	926	142	1,068	
7:30-7:45	453	102	555		17:30-17:45	743	127	870	
7:45-8:00	383	80	463		17:45-18:00	521	85	606	
8:00-8:15	573	98	671		18:00-18:15	690	100	790	
8:15-8:30	528	128	656		18:15-18:30	574	107	681	
8:30-8:45	589	123	712		18:30-18:45	636	93	729	
8:45-9:00	453	84	537		18:45-19:00	516	83	599	
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6:00-7:00	1,302	328	1,630	20%	16:00-17:00	3,690	494	4,184	12%
6:15-7:15	1,357	320	1,677	19%	16:15-17:15	3,829	509	4,338	12%
6:30-7:30	1,512	352	1,864	19%	16:30-17:30	3,832	525	4,357	12%
6:45-7:45	1,601	358	1,959	18%	16:45-17:45	3,658	538	4,196	13%
7:00-8:00	1,620	347	1,967	18%	17:00-18:00	3,234	486	3,720	13%
7:15-8:15	1,830	377	2,207	17%	17:15-18:15	2,880	454	3,334	14%
7:30-8:30	1,937	408	2,345	17%	17:30-18:30	2,528	419	2,947	14%
7:45-8:45	2,073	429	2,502	17%	17:45-18:45	2,421	385	2,806	14%
8:00-9:00	2,143	433	2,576	17%	18:00-19:00	2,416	383	2,799	14%
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Total	5,065	1,108	6,173	18%	Total	9,340	1,363	10,703	13%

NBT-SR 99 NB - Fall "SR-99 NB n/o Stockdale Hwy"

AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	976	176	1,152		16:00-16:15	835	102	937	
6:15-6:30	957	188	1,145		16:15-16:30	774	100	874	
6:30-6:45	1,020	178	1,198		16:30-16:45	843	125	968	
6:45-7:00	1,270	212	1,482		16:45-17:00	852	100	952	
7:00-7:15	989	170	1,159		17:00-17:15	833	71	904	
7:15-7:30	1,226	176	1,402		17:15-17:30	855	103	958	
7:30-7:45	1,418	147	1,565		17:30-17:45	897	103	1,000	
7:45-8:00	1,479	182	1,661		17:45-18:00	880	110	990	
8:00-8:15	1,057	183	1,240		18:00-18:15	742	74	816	
8:15-8:30	1,001	161	1,162		18:15-18:30	703	70	773	
8:30-8:45	901	156	1,057		18:30-18:45	692	69	761	
8:45-9:00	836	177	1,013		18:45-19:00	655	46	701	
<hr/>					<hr/>				
6:00-7:00	4,223	754	4,977	15%	16:00-17:00	3,304	427	3,731	11%
6:15-7:15	4,236	748	4,984	15%	16:15-17:15	3,302	396	3,698	11%
6:30-7:30	4,505	736	5,241	14%	16:30-17:30	3,383	399	3,782	11%
6:45-7:45	4,903	705	5,608	13%	16:45-17:45	3,437	377	3,814	10%
7:00-8:00	5,112	675	5,787	12%	17:00-18:00	3,465	387	3,852	10%
7:15-8:15	5,180	688	5,868	12%	17:15-18:15	3,374	390	3,764	10%
7:30-8:30	4,955	673	5,628	12%	17:30-18:30	3,222	357	3,579	10%
7:45-8:45	4,438	682	5,120	13%	17:45-18:45	3,017	323	3,340	10%
8:00-9:00	3,795	677	4,472	15%	18:00-19:00	2,792	259	3,051	8%
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Total	13,130	2,106	15,236	14%	Total	9,561	1,073	10,634	10%

SBT-SR 99 - Fall "SR-99 SB n/o Stockdale Hwy"

AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	219	132	351		16:00-16:15	713	151	864	
6:15-6:30	275	143	418		16:15-16:30	624	158	782	
6:30-6:45	320	117	437		16:30-16:45	630	166	796	
6:45-7:00	367	132	499		16:45-17:00	675	135	810	
7:00-7:15	395	138	533		17:00-17:15	801	115	916	
7:15-7:30	430	152	582		17:15-17:30	729	122	851	
7:30-7:45	502	162	664		17:30-17:45	601	127	728	
7:45-8:00	504	149	653		17:45-18:00	561	149	710	
8:00-8:15	458	185	643		18:00-18:15	538	133	671	
8:15-8:30	469	167	636		18:15-18:30	502	122	624	
8:30-8:45	407	165	572		18:30-18:45	472	118	590	
8:45-9:00	414	132	546		18:45-19:00	355	89	444	
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6:00-7:00	1,181	524	1,705	31%	16:00-17:00	2,642	610	3,252	19%
6:15-7:15	1,357	530	1,887	28%	16:15-17:15	2,730	574	3,304	17%
6:30-7:30	1,512	539	2,051	26%	16:30-17:30	2,835	538	3,373	16%
6:45-7:45	1,694	584	2,278	26%	16:45-17:45	2,806	499	3,305	15%
7:00-8:00	1,831	601	2,432	25%	17:00-18:00	2,692	513	3,205	16%
7:15-8:15	1,894	648	2,542	25%	17:15-18:15	2,429	531	2,960	18%
7:30-8:30	1,933	663	2,596	26%	17:30-18:30	2,202	531	2,733	19%
7:45-8:45	1,838	666	2,504	27%	17:45-18:45	2,073	522	2,595	20%
8:00-9:00	1,748	649	2,397	27%	18:00-19:00	1,867	462	2,329	20%
<hr/>					<hr/>				
Total	4,760	1,774	6,534	27%	Total	7,201	1,585	8,786	18%

**CENTENNIAL CORRIDOR PROJECT
EXISTING TRUCK VOLUMES AND PERCENTAGES
AT SR-58 / SR-99 SYSTEM INTERCHANGE RAMPS**

WBT - SR 58 WB - Spring "SR-58 WB w/o SR-99"

AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	177	19	196		16:00-16:15	468	15	483	
6:15-6:30	195	20	215		16:15-16:30	425	15	440	
6:30-6:45	252	29	281		16:30-16:45	441	32	473	
6:45-7:00	297	19	316		16:45-17:00	417	22	439	
7:00-7:15	270	32	302		17:00-17:15	488	21	509	
7:15-7:30	297	25	322		17:15-17:30	459	25	484	
7:30-7:45	218	19	237		17:30-17:45	441	8	449	
7:45-8:00	449	39	488		17:45-18:00	426	10	436	
8:00-8:15	324	28	352		18:00-18:15	387	20	407	
8:15-8:30	341	27	368		18:15-18:30	307	7	314	
8:30-8:45	309	38	347		18:30-18:45	291	7	298	
8:45-9:00	312	24	336		18:45-19:00	298	26	324	
Total					Total				
3,441					4,848				
319					208				
3,760					5,056				
8%					4%				

WBT - SR 58 WB - Fall "SR-58 WB w/o SR-99"

AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	73	11	84		16:00-16:15	294	3	297	
6:15-6:30	69	11	80		16:15-16:30	233	17	250	
6:30-6:45	107	17	124		16:30-16:45	285	7	292	
6:45-7:00	131	26	157		16:45-17:00	290	7	297	
7:00-7:15	110	17	127		17:00-17:15	288	11	299	
7:15-7:30	166	35	201		17:15-17:30	297	9	306	
7:30-7:45	200	22	222		17:30-17:45	225	2	227	
7:45-8:00	259	14	273		17:45-18:00	254	6	260	
8:00-8:15	241	14	255		18:00-18:15	194	9	203	
8:15-8:30	183	20	203		18:15-18:30	165	2	167	
8:30-8:45	182	15	197		18:30-18:45	122	6	128	
8:45-9:00	182	8	190		18:45-19:00	129	6	135	
Total					Total				
1,903					2,776				
210					85				
2,113					2,861				
10%					3%				

EBT-SR 58 EB - Spring "SR-58 EB w/o SR-99"

AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	80	9	89		16:00-16:15	220	8	228	
6:15-6:30	90	6	96		16:15-16:30	216	6	222	
6:30-6:45	150	8	158		16:30-16:45	240	9	249	
6:45-7:00	185	11	196		16:45-17:00	184	12	196	
7:00-7:15	181	9	190		17:00-17:15	244	9	253	
7:15-7:30	182	7	189		17:15-17:30	242	10	252	
7:30-7:45	210	12	222		17:30-17:45	257	7	264	
7:45-8:00	252	17	269		17:45-18:00	251	8	259	
8:00-8:15	172	17	189		18:00-18:15	200	10	210	
8:15-8:30	133	10	143		18:15-18:30	169	5	174	
8:30-8:45	115	6	121		18:30-18:45	193	10	203	
8:45-9:00	154	11	165		18:45-19:00	148	5	153	
Total					Total				
505					860				
34					35				
539					895				
6%					4%				
606					884				
34					36				
640					920				
5%					4%				
698					910				
35					40				
733					950				
5%					4%				
758					927				
39					38				
797					985				
5%					4%				
825					994				
45					34				
870					1,028				
5%					3%				
816					950				
53					35				
869					985				
6%					4%				
767					877				
56					30				
823					907				
7%					3%				
672					813				
50					33				
722					846				
7%					4%				
574					710				
44					30				
618					740				
7%					4%				
Total					Total				
1,904					2,564				
123					99				
2,027					2,663				
6%					4%				

EBT -SR 58 EB - Fall "SR-58 EB w/o SR-99"

AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	57	11	68		16:00-16:15	170	20	190	
6:15-6:30	79	6	85		16:15-16:30	163	9	172	
6:30-6:45	103	10	113		16:30-16:45	185	9	194	
6:45-7:00	173	8	181		16:45-17:00	195	15	210	
7:00-7:15	159	5	164		17:00-17:15	185	11	196	
7:15-7:30	219	10	229		17:15-17:30	236	7	243	
7:30-7:45	223	12	235		17:30-17:45	215	8	223	
7:45-8:00	230	12	242		17:45-18:00	176	12	188	
8:00-8:15	184	19	203		18:00-18:15	171	14	185	
8:15-8:30	138	11	149		18:15-18:30	140	3	143	
8:30-8:45	112	19	131		18:30-18:45	174	3	177	
8:45-9:00	107	9	116		18:45-19:00	184	2	186	
6:00-7:00	412	35	447	8%	16:00-17:00	713	53	766	7%
6:15-7:15	514	29	543	5%	16:15-17:15	728	44	772	6%
6:30-7:30	654	33	687	5%	16:30-17:30	801	42	843	5%
6:45-7:45	774	35	809	4%	16:45-17:45	831	41	872	5%
7:00-8:00	831	39	870	4%	17:00-18:00	812	38	850	4%
7:15-8:15	856	53	909	6%	17:15-18:15	798	41	839	5%
7:30-8:30	775	54	829	7%	17:30-18:30	702	37	739	5%
7:45-8:45	664	61	725	8%	17:45-18:45	661	32	693	5%
8:00-9:00	541	58	599	10%	18:00-19:00	669	22	691	3%
Total	1,784	132	1,916	7%	Total	2,194	113	2,307	5%

**CENTENNIAL CORRIDOR PROJECT
EXISTING TRUCK VOLUMES AND PERCENTAGES
AT SR-58 / SR-99 SYSTEM INTERCHANGE RAMP**

EBR - SR 58 EB to SR 99 SB - Spring "NA"										EBR - SR 58 EB to SR 99 SB - Fall "SR-99 SB SR-58 EB Off-Ramp"									
AM Peak					PM Peak					AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	NA	NA	NA		16:00-16:15	NA	NA	NA		6:00-6:15	20	1	21		16:00-16:15	54	4	58	
6:15-6:30	NA	NA	NA		16:15-16:30	NA	NA	NA		6:15-6:30	25	3	28		16:15-16:30	47	3	50	
6:30-6:45	NA	NA	NA		16:30-16:45	NA	NA	NA		6:30-6:45	21	2	23		16:30-16:45	62	4	66	
6:45-7:00	NA	NA	NA		16:45-17:00	NA	NA	NA		6:45-7:00	30	0	30		16:45-17:00	63	8	71	
7:00-7:15	NA	NA	NA		17:00-17:15	NA	NA	NA		7:00-7:15	27	4	31		17:00-17:15	63	5	68	
7:15-7:30	NA	NA	NA		17:15-17:30	NA	NA	NA		7:15-7:30	41	3	44		17:15-17:30	65	1	66	
7:30-7:45	NA	NA	NA		17:30-17:45	NA	NA	NA		7:30-7:45	45	2	47		17:30-17:45	71	1	72	
7:45-8:00	NA	NA	NA		17:45-18:00	NA	NA	NA		7:45-8:00	44	3	47		17:45-18:00	70	4	74	
8:00-8:15	NA	NA	NA		18:00-18:15	NA	NA	NA		8:00-8:15	29	3	32		18:00-18:15	65	1	66	
8:15-8:30	NA	NA	NA		18:15-18:30	NA	NA	NA		8:15-8:30	30	8	38		18:15-18:30	60	2	62	
8:30-8:45	NA	NA	NA		18:30-18:45	NA	NA	NA		8:30-8:45	30	6	36		18:30-18:45	60	0	60	
8:45-9:00	NA	NA	NA		18:45-19:00	NA	NA	NA		8:45-9:00	27	7	34		18:45-19:00	37	1	38	
<hr/>					<hr/>					<hr/>					<hr/>				
6:00-7:00	NA	NA	NA	NA	16:00-17:00	NA	NA	NA	NA	6:00-7:00	96	6	102	6%	16:00-17:00	226	19	245	8%
6:15-7:15	NA	NA	NA	NA	16:15-17:15	NA	NA	NA	NA	6:15-7:15	103	9	112	8%	16:15-17:15	235	20	255	8%
6:30-7:30	NA	NA	NA	NA	16:30-17:30	NA	NA	NA	NA	6:30-7:30	119	9	128	7%	16:30-17:30	253	18	271	7%
6:45-7:45	NA	NA	NA	NA	16:45-17:45	NA	NA	NA	NA	6:45-7:45	143	9	152	6%	16:45-17:45	262	15	277	5%
7:00-8:00	NA	NA	NA	NA	17:00-18:00	NA	NA	NA	NA	7:00-8:00	157	12	169	7%	17:00-18:00	269	11	280	4%
7:15-8:15	NA	NA	NA	NA	17:15-18:15	NA	NA	NA	NA	7:15-8:15	159	11	170	6%	17:15-18:15	271	7	278	3%
7:30-8:30	NA	NA	NA	NA	17:30-18:30	NA	NA	NA	NA	7:30-8:30	148	16	164	10%	17:30-18:30	266	8	274	3%
7:45-8:45	NA	NA	NA	NA	17:45-18:45	NA	NA	NA	NA	7:45-8:45	133	20	153	13%	17:45-18:45	255	7	262	3%
8:00-9:00	NA	NA	NA	NA	18:00-19:00	NA	NA	NA	NA	8:00-9:00	116	24	140	17%	18:00-19:00	222	4	226	2%
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Total	NA	NA	NA	NA	Total	NA	NA	NA	NA	Total	369	42	411	10%	Total	717	34	751	5%

Source: Parsons/HNTB analysis of data from KOA, Draft Report for SR-58 Origin and Destination Truck Study, January 26, 2009.

Notes:

AM Peak Period: 6:00-9:00 AM

PM Peak Period: 4:00-7:00 PM

Legend:

NBR-SR 99 NB to SR 58 EB - Spring "SR-99 NB off-ramp connector to SR-58 EB"

NBR - Equivalent movement assuming I/C is an intersection.

SR 99 NB to SR 58 EB - Ramp

Spring - Data set. Note: Data set includes Spring and Fall data.

"SR-99 NB off-ramp connector to SR-58 EB" - Location label in data set. Note: Location not consistently used in Spring and Fall data sets.

"NA" - Not Available

SR 99 MAINLINE

**CENTENNIAL CORRIDOR PROJECT
EXISTING TRUCK VOLUMES AND PERCENTAGES
AT SR-99 MAINLINE**

SR 99 NB North of SR 58 - Spring "NBT+WBR"										SR 99 NB North of SR 58 - Fall "NBT+WBR"									
AM Peak					PM Peak					AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	653	139	792		16:00-16:15	1,198	135	1,333		6:00-6:15	1,252	224	1,476		16:00-16:15	959	169	1,128	
6:15-6:30	553	123	676		16:15-16:30	1,342	181	1,523		6:15-6:30	1,196	235	1,431		16:15-16:30	973	176	1,149	
6:30-6:45	1,323	200	1,523		16:30-16:45	1,108	133	1,241		6:30-6:45	1,257	238	1,495		16:30-16:45	1,028	194	1,222	
6:45-7:00	893	257	1,150		16:45-17:00	1,241	139	1,380		6:45-7:00	1,495	296	1,791		16:45-17:00	1,059	179	1,238	
7:00-7:15	1,070	164	1,234		17:00-17:15	1,092	150	1,242		7:00-7:15	1,144	226	1,370		17:00-17:15	1,047	112	1,159	
7:15-7:30	1,223	173	1,396		17:15-17:30	1,090	143	1,233		7:15-7:30	1,372	247	1,619		17:15-17:30	1,068	142	1,210	
7:30-7:45	1,370	176	1,546		17:30-17:45	1,029	161	1,190		7:30-7:45	1,635	227	1,862		17:30-17:45	1,066	144	1,210	
7:45-8:00	1,557	203	1,760		17:45-18:00	904	131	1,035		7:45-8:00	1,724	252	1,976		17:45-18:00	1,048	157	1,205	
8:00-8:15	1,040	199	1,239		18:00-18:15	911	128	1,039		8:00-8:15	1,208	270	1,478		18:00-18:15	889	118	1,007	
8:15-8:30	1,026	204	1,230		18:15-18:30	819	150	969		8:15-8:30	1,172	235	1,407		18:15-18:30	837	130	967	
8:30-8:45	870	174	1,044		18:30-18:45	753	127	880		8:30-8:45	1,023	231	1,254		18:30-18:45	824	108	932	
8:45-9:00	868	171	1,039		18:45-19:00	731	139	870		8:45-9:00	972	252	1,224		18:45-19:00	773	90	863	
<hr/>					<hr/>					<hr/>					<hr/>				
6:00-7:00	3,422	719	4,141	17%	16:00-17:00	4,889	588	5,477	11%	6:00-7:00	5,200	993	6,193	16%	16:00-17:00	4,019	718	4,737	15%
6:15-7:15	3,839	744	4,583	18%	16:15-17:15	4,783	603	5,386	11%	6:15-7:15	5,092	995	6,087	16%	16:15-17:15	4,107	661	4,768	14%
6:30-7:30	4,509	794	5,303	15%	16:30-17:30	4,531	565	5,096	11%	6:30-7:30	5,268	1,007	6,275	16%	16:30-17:30	4,202	627	4,829	13%
6:45-7:45	4,556	770	5,326	14%	16:45-17:45	4,452	593	5,045	12%	6:45-7:45	5,646	996	6,642	15%	16:45-17:45	4,240	577	4,817	12%
7:00-8:00	5,220	716	5,936	12%	17:00-18:00	4,115	585	4,700	12%	7:00-8:00	5,875	952	6,827	14%	17:00-18:00	4,229	555	4,784	12%
7:15-8:15	5,190	751	5,941	13%	17:15-18:15	3,934	563	4,497	13%	7:15-8:15	5,939	998	6,935	14%	17:15-18:15	4,071	561	4,632	12%
7:30-8:30	4,993	782	5,775	14%	17:30-18:30	3,663	570	4,233	13%	7:30-8:30	5,739	984	6,723	15%	17:30-18:30	3,840	549	4,389	13%
7:45-8:45	4,493	780	5,273	15%	17:45-18:45	3,387	536	3,923	14%	7:45-8:45	5,127	988	6,115	16%	17:45-18:45	3,598	513	4,111	12%
8:00-9:00	3,804	748	4,552	16%	18:00-19:00	3,214	544	3,758	14%	8:00-9:00	4,375	988	5,363	18%	18:00-19:00	3,323	446	3,769	12%
Total	12,446	2,183	14,629	15%	Total	12,218	1,717	13,935	12%	Total	15,450	2,933	18,383	16%	Total	11,571	1,719	13,290	13%

SR 99 NB South of SR 58 - Spring "NBT+NBR"										SR 99 NB South of SR 58 - Fall "NBT+NBR"									
AM Peak					PM Peak					AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	610	119	729		16:00-16:15	1,159	109	1,268		6:00-6:15	1,196	214	1,410		16:00-16:15	1,080	132	1,212	
6:15-6:30	540	90	630		16:15-16:30	1,065	115	1,180		6:15-6:30	1,238	225	1,463		16:15-16:30	1,020	122	1,142	
6:30-6:45	1,279	167	1,446		16:30-16:45	1,120	106	1,226		6:30-6:45	1,327	206	1,533		16:30-16:45	1,081	145	1,226	
6:45-7:00	929	230	1,159		16:45-17:00	1,055	123	1,178		6:45-7:00	1,639	255	1,894		16:45-17:00	1,068	125	1,193	
7:00-7:15	1,149	120	1,269		17:00-17:15	1,160	135	1,295		7:00-7:15	1,308	209	1,517		17:00-17:15	1,063	98	1,161	
7:15-7:30	1,359	141	1,500		17:15-17:30	1,028	91	1,119		7:15-7:30	1,454	227	1,681		17:15-17:30	1,103	125	1,228	
7:30-7:45	1,477	135	1,612		17:30-17:45	1,054	126	1,180		7:30-7:45	1,600	183	1,783		17:30-17:45	1,166	128	1,294	
7:45-8:00	1,653	178	1,831		17:45-18:00	991	106	1,097		7:45-8:00	1,654	212	1,866		17:45-18:00	1,145	129	1,274	
8:00-8:15	1,167	173	1,340		18:00-18:15	955	106	1,061		8:00-8:15	1,160	203	1,363		18:00-18:15	944	93	1,037	
8:15-8:30	1,108	176	1,284		18:15-18:30	877	112	989		8:15-8:30	1,121	178	1,299		18:15-18:30	913	87	1,000	
8:30-8:45	910	123	1,033		18:30-18:45	802	105	907		8:30-8:45	1,081	181	1,262		18:30-18:45	840	79	919	
8:45-9:00	917	123	1,040		18:45-19:00	798	102	900		8:45-9:00	1,058	224	1,282		18:45-19:00	839	56	895	
<hr/>					<hr/>					<hr/>					<hr/>				
6:00-7:00	3,358	606	3,964	15%	16:00-17:00	4,399	453	4,852	9%	6:00-7:00	5,400	900	6,300	14%	16:00-17:00	4,249	524	4,773	11%
6:15-7:15	3,897	607	4,504	13%	16:15-17:15	4,400	479	4,879	10%	6:15-7:15	5,512	895	6,407	14%	16:15-17:15	4,232	490	4,722	10%
6:30-7:30	4,716	658	5,374	12%	16:30-17:30	4,363	455	4,818	9%	6:30-7:30	5,728	897	6,625	14%	16:30-17:30	4,315	493	4,808	10%
6:45-7:45	4,914	626	5,540	11%	16:45-17:45	4,297	475	4,772	10%	6:45-7:45	6,001	874	6,875	13%	16:45-17:45	4,400	476	4,876	10%
7:00-8:00	5,638	574	6,212	9%	17:00-18:00	4,233	458	4,691	10%	7:00-8:00	6,016	831	6,847	12%	17:00-18:00	4,477	480	4,957	10%
7:15-8:15	5,656	627	6,283	10%	17:15-18:15	4,028	429	4,457	10%	7:15-8:15	5,868	825	6,693	12%	17:15-18:15	4,358	475	4,833	10%
7:30-8:30	5,405	862	6,067	11%	17:30-18:30	3,877	450	4,327	10%	7:30-8:30	5,535	776	6,311	12%	17:30-18:30	4,168	437	4,605	9%
7:45-8:45	4,838	650	5,488	12%	17:45-18:45	3,625	429	4,054	11%	7:45-8:45	5,016	774	5,790	13%	17:45-18:45	3,842	388	4,230	9%
8:00-9:00	4,102	595	4,697	13%	18:00-19:00	3,432	425	3,857	11%	8:00-9:00	4,420	786	5,206	15%	18:00-19:00	3,536	315	3,851	8%
Total	13,098	1,775	14,873	12%	Total	12,064	1,336	13,400	10%	Total	15,836	2,517	18,353	14%	Total	12,262	1,319	13,581	10%

Source: Parsons/HNTB analysis of data from KOA, Draft Report for SR-58 Origin and Destination Truck Study, January 26, 2009.

Note: NA or #VALUE! Indicates data not available.

**CENTENNIAL CORRIDOR PROJECT
EXISTING TRUCK VOLUMES AND PERCENTAGES
AT SR-99 MAINLINE**

SR 99 SB North of SR 58 - Spring "SBT+SBL"										SR 99 SB North of SR 58 - Fall "SBT+SBL"									
AM Peak					PM Peak					AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	NA	NA	NA		18:00-18:15	1,192	214	1,406		6:00-6:15	321	171	492		16:00-16:15	1,000	248	1,248	
6:15-6:30	NA	NA	NA		16:15-16:30	1,162	218	1,380		6:15-6:30	394	187	581		16:15-16:30	863	250	1,113	
6:30-6:45	NA	NA	NA		16:30-16:45	1,179	186	1,365		6:30-6:45	436	186	622		16:30-16:45	892	238	1,130	
6:45-7:00	NA	NA	NA		16:45-17:00	1,194	224	1,418		6:45-7:00	551	190	741		16:45-17:00	924	222	1,146	
7:00-7:15	NA	NA	NA		17:00-17:15	1,230	198	1,428		7:00-7:15	550	190	740		17:00-17:15	987	181	1,168	
7:15-7:30	NA	NA	NA		17:15-17:30	1,168	214	1,382		7:15-7:30	620	202	822		17:15-17:30	971	194	1,165	
7:30-7:45	NA	NA	NA		17:30-17:45	925	204	1,129		7:30-7:45	664	226	890		17:30-17:45	783	204	987	
7:45-8:00	NA	NA	NA		17:45-18:00	708	155	863		7:45-8:00	716	210	926		17:45-18:00	748	219	967	
8:00-8:15	NA	NA	NA		18:00-18:15	844	184	1,028		8:00-8:15	616	248	864		18:00-18:15	692	217	909	
8:15-8:30	NA	NA	NA		18:15-18:30	697	195	892		8:15-8:30	605	234	839		18:15-18:30	625	210	835	
8:30-8:45	NA	NA	NA		18:30-18:45	757	178	935		8:30-8:45	543	232	775		18:30-18:45	593	203	796	
8:45-9:00	NA	NA	NA		18:45-19:00	627	157	784		8:45-9:00	552	205	757		18:45-19:00	466	163	629	
6:00-7:00	NA	NA	NA	NA	16:00-17:00	4,727	842	5,569	15%	6:00-7:00	1,702	734	2,436	30%	16:00-17:00	3,679	958	4,637	21%
6:15-7:15	NA	NA	NA	NA	16:15-17:15	4,765	826	5,591	15%	6:15-7:15	1,931	753	2,684	28%	16:15-17:15	3,666	891	4,557	20%
6:30-7:30	NA	NA	NA	NA	16:30-17:30	4,771	822	5,593	15%	6:30-7:30	2,157	768	2,925	26%	16:30-17:30	3,774	835	4,609	18%
6:45-7:45	NA	NA	NA	NA	16:45-17:45	4,517	840	5,357	16%	6:45-7:45	2,385	808	3,193	25%	16:45-17:45	3,665	801	4,466	18%
7:00-8:00	NA	NA	NA	NA	17:00-18:00	4,031	771	4,802	16%	7:00-8:00	2,550	828	3,378	25%	17:00-18:00	3,489	798	4,287	19%
7:15-8:15	NA	NA	NA	NA	17:15-18:15	3,645	757	4,402	17%	7:15-8:15	2,616	886	3,502	25%	17:15-18:15	3,194	834	4,028	21%
7:30-8:30	NA	NA	NA	NA	17:30-18:30	3,174	738	3,912	19%	7:30-8:30	2,601	918	3,519	26%	17:30-18:30	2,848	850	3,698	23%
7:45-8:45	NA	NA	NA	NA	17:45-18:45	3,006	712	3,718	19%	7:45-8:45	2,480	924	3,404	27%	17:45-18:45	2,658	849	3,507	24%
8:00-9:00	NA	NA	NA	NA	18:00-19:00	2,925	714	3,639	20%	8:00-9:00	2,316	919	3,235	28%	18:00-19:00	2,376	793	3,169	25%
Total	NA	NA	NA	NA	Total	11,683	2,327	14,010	17%	Total	6,568	2,481	9,049	27%	Total	9,544	2,549	12,093	21%
SR 99 SB South of SR 58 - Spring "SBT+EBR+WBL"										SR 99 SB South of SR 58 - Fall "SBT+EBR+WBL"									
AM Peak					PM Peak					AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	NA	NA	NA		16:00-16:15	NA	NA	NA		6:00-6:15	424	166	590		16:00-16:15	1,038	171	1,209	
6:15-6:30	NA	NA	NA		16:15-16:30	NA	NA	NA		6:15-6:30	462	183	645		16:15-16:30	931	186	1,117	
6:30-6:45	NA	NA	NA		16:30-16:45	NA	NA	NA		6:30-6:45	498	158	656		16:30-16:45	964	185	1,149	
6:45-7:00	NA	NA	NA		16:45-17:00	NA	NA	NA		6:45-7:00	542	184	726		16:45-17:00	1,009	161	1,170	
7:00-7:15	NA	NA	NA		17:00-17:15	NA	NA	NA		7:00-7:15	580	167	727		17:00-17:15	1,135	148	1,283	
7:15-7:30	NA	NA	NA		17:15-17:30	NA	NA	NA		7:15-7:30	620	175	795		17:15-17:30	1,113	134	1,247	
7:30-7:45	NA	NA	NA		17:30-17:45	NA	NA	NA		7:30-7:45	763	196	959		17:30-17:45	993	154	1,147	
7:45-8:00	NA	NA	NA		17:45-18:00	NA	NA	NA		7:45-8:00	795	178	973		17:45-18:00	899	171	1,070	
8:00-8:15	NA	NA	NA		18:00-18:15	NA	NA	NA		8:00-8:15	650	210	860		18:00-18:15	808	141	949	
8:15-8:30	NA	NA	NA		18:15-18:30	NA	NA	NA		8:15-8:30	660	203	863		18:15-18:30	773	143	916	
8:30-8:45	NA	NA	NA		18:30-18:45	NA	NA	NA		8:30-8:45	588	191	779		18:30-18:45	714	130	844	
8:45-9:00	NA	NA	NA		18:45-19:00	NA	NA	NA		8:45-9:00	588	161	749		18:45-19:00	437	95	532	
6:00-7:00	NA	NA	NA	NA	16:00-17:00	NA	NA	NA	NA	6:00-7:00	1,926	691	2,617	26%	16:00-17:00	3,942	703	4,645	15%
6:15-7:15	NA	NA	NA	NA	16:15-17:15	NA	NA	NA	NA	6:15-7:15	2,062	692	2,754	25%	16:15-17:15	4,039	680	4,719	14%
6:30-7:30	NA	NA	NA	NA	16:30-17:30	NA	NA	NA	NA	6:30-7:30	2,220	684	2,904	24%	16:30-17:30	4,221	628	4,849	13%
6:45-7:45	NA	NA	NA	NA	16:45-17:45	NA	NA	NA	NA	6:45-7:45	2,485	722	3,207	23%	16:45-17:45	4,250	597	4,847	12%
7:00-8:00	NA	NA	NA	NA	17:00-18:00	NA	NA	NA	NA	7:00-8:00	2,738	716	3,454	21%	17:00-18:00	4,140	607	4,747	13%
7:15-8:15	NA	NA	NA	NA	17:15-18:15	NA	NA	NA	NA	7:15-8:15	2,828	759	3,587	21%	17:15-18:15	3,813	600	4,413	14%
7:30-8:30	NA	NA	NA	NA	17:30-18:30	NA	NA	NA	NA	7:30-8:30	2,868	787	3,655	22%	17:30-18:30	3,473	609	4,082	15%
7:45-8:45	NA	NA	NA	NA	17:45-18:45	NA	NA	NA	NA	7:45-8:45	2,693	782	3,475	23%	17:45-18:45	3,194	585	3,779	15%
8:00-9:00	NA	NA	NA	NA	18:00-19:00	NA	NA	NA	NA	8:00-9:00	2,486	765	3,251	24%	18:00-19:00	2,732	509	3,241	16%
Total	NA	NA	NA	NA	Total	NA	NA	NA	NA	Total	7,150	2,172	9,322	23%	Total	10,814	1,819	12,633	14%

SR 58 MAINLINE

**CENTENNIAL CORRIDOR PROJECT
EXISTING TRUCK VOLUMES AND PERCENTAGES
AT SR-58 MAINLINE**

SR 58 EB East of SR 99 - Spring "EBT+NBR+SBL"										SR 58 EB East of SR 99 - Fall "EBT+NBR+SBL"									
AM Peak					PM Peak					AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	NA	NA	NA		16:00-16:15	NA	NA	NA		6:00-6:15	379	88	467		16:00-16:15	702	147	849	
6:15-6:30	NA	NA	NA		16:15-16:30	NA	NA	NA		6:15-6:30	479	87	566		16:15-16:30	648	123	771	
6:30-6:45	NA	NA	NA		16:30-16:45	NA	NA	NA		6:30-6:45	526	107	633		16:30-16:45	685	101	786	
6:45-7:00	NA	NA	NA		16:45-17:00	NA	NA	NA		6:45-7:00	726	109	835		16:45-17:00	660	127	787	
7:00-7:15	NA	NA	NA		17:00-17:15	NA	NA	NA		7:00-7:15	633	96	729		17:00-17:15	601	104	705	
7:15-7:30	NA	NA	NA		17:15-17:30	NA	NA	NA		7:15-7:30	637	111	748		17:15-17:30	726	101	827	
7:30-7:45	NA	NA	NA		17:30-17:45	NA	NA	NA		7:30-7:45	587	112	679		17:30-17:45	666	110	776	
7:45-8:00	NA	NA	NA		17:45-18:00	NA	NA	NA		7:45-8:00	617	103	720		17:45-18:00	628	101	729	
8:00-8:15	NA	NA	NA		18:00-18:15	NA	NA	NA		8:00-8:15	445	102	547		18:00-18:15	527	117	644	
8:15-8:30	NA	NA	NA		18:15-18:30	NA	NA	NA		8:15-8:30	394	95	489		18:15-18:30	473	108	581	
8:30-8:45	NA	NA	NA		18:30-18:45	NA	NA	NA		8:30-8:45	428	111	539		18:30-18:45	443	98	541	
8:45-9:00	NA	NA	NA		18:45-19:00	NA	NA	NA		8:45-9:00	467	129	596		18:45-19:00	478	86	565	
6:00-7:00	NA	NA	NA	NA	16:00-17:00	NA	NA	NA	NA	6:00-7:00	2,110	391	2,501	16%	16:00-17:00	2,695	498	3,193	16%
6:15-7:15	NA	NA	NA	NA	16:15-17:15	NA	NA	NA	NA	6:15-7:15	2,364	399	2,763	14%	16:15-17:15	2,594	455	3,049	15%
6:30-7:30	NA	NA	NA	NA	16:30-17:30	NA	NA	NA	NA	6:30-7:30	2,522	423	2,945	14%	16:30-17:30	2,672	433	3,105	14%
6:45-7:45	NA	NA	NA	NA	16:45-17:45	NA	NA	NA	NA	6:45-7:45	2,563	428	2,991	14%	16:45-17:45	2,653	442	3,095	14%
7:00-8:00	NA	NA	NA	NA	17:00-18:00	NA	NA	NA	NA	7:00-8:00	2,454	422	2,876	15%	17:00-18:00	2,621	416	3,037	14%
7:15-8:15	NA	NA	NA	NA	17:15-18:15	NA	NA	NA	NA	7:15-8:15	2,266	428	2,694	16%	17:15-18:15	2,547	429	2,976	14%
7:30-8:30	NA	NA	NA	NA	17:30-18:30	NA	NA	NA	NA	7:30-8:30	2,023	412	2,435	17%	17:30-18:30	2,294	436	2,730	16%
7:45-8:45	NA	NA	NA	NA	17:45-18:45	NA	NA	NA	NA	7:45-8:45	1,884	411	2,295	18%	17:45-18:45	2,071	424	2,495	17%
8:00-9:00	NA	NA	NA	NA	18:00-19:00	NA	NA	NA	NA	8:00-9:00	1,734	437	2,171	20%	18:00-19:00	1,922	409	2,331	18%
Total	NA	NA	NA	NA	Total	NA	NA	NA	NA	Total	6,298	1,250	7,548	17%	Total	7,238	1,323	8,561	15%

SR 58 WB East of SR 99 - Spring "WBT+WBL+WBR"										SR 58 WB East of SR 99 - Fall "WBT+WBL+WBR"									
AM Peak					PM Peak					AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	NA	NA	NA		16:00-16:15	NA	NA	NA		6:00-6:15	534	92	626		16:00-16:15	689	86	775	
6:15-6:30	NA	NA	NA		16:15-16:30	NA	NA	NA		6:15-6:30	470	95	565		16:15-16:30	692	118	810	
6:30-6:45	NA	NA	NA		16:30-16:45	NA	NA	NA		6:30-6:45	501	116	617		16:30-16:45	742	91	833	
6:45-7:00	NA	NA	NA		16:45-17:00	NA	NA	NA		6:45-7:00	501	162	663		16:45-17:00	768	104	872	
7:00-7:15	NA	NA	NA		17:00-17:15	NA	NA	NA		7:00-7:15	403	98	501		17:00-17:15	773	80	853	
7:15-7:30	NA	NA	NA		17:15-17:30	NA	NA	NA		7:15-7:30	461	126	587		17:15-17:30	829	59	888	
7:30-7:45	NA	NA	NA		17:30-17:45	NA	NA	NA		7:30-7:45	633	134	767		17:30-17:45	715	69	784	
7:45-8:00	NA	NA	NA		17:45-18:00	NA	NA	NA		7:45-8:00	751	110	861		17:45-18:00	690	71	761	
8:00-8:15	NA	NA	NA		18:00-18:15	NA	NA	NA		8:00-8:15	555	123	678		18:00-18:15	546	60	606	
8:15-8:30	NA	NA	NA		18:15-18:30	NA	NA	NA		8:15-8:30	515	122	637		18:15-18:30	510	81	591	
8:30-8:45	NA	NA	NA		18:30-18:45	NA	NA	NA		8:30-8:45	455	110	565		18:30-18:45	436	57	493	
8:45-9:00	NA	NA	NA		18:45-19:00	NA	NA	NA		8:45-9:00	465	105	570		18:45-19:00	292	55	347	
6:00-7:00	NA	NA	NA	NA	16:00-17:00	NA	NA	NA	NA	6:00-7:00	2,006	465	2,471	19%	16:00-17:00	2,891	399	3,290	12%
6:15-7:15	NA	NA	NA	NA	16:15-17:15	NA	NA	NA	NA	6:15-7:15	1,875	471	2,346	20%	16:15-17:15	2,975	393	3,368	12%
6:30-7:30	NA	NA	NA	NA	16:30-17:30	NA	NA	NA	NA	6:30-7:30	1,666	502	2,368	21%	16:30-17:30	3,112	334	3,446	10%
6:45-7:45	NA	NA	NA	NA	16:45-17:45	NA	NA	NA	NA	6:45-7:45	1,998	520	2,518	21%	16:45-17:45	3,085	312	3,397	9%
7:00-8:00	NA	NA	NA	NA	17:00-18:00	NA	NA	NA	NA	7:00-8:00	2,248	468	2,716	17%	17:00-18:00	3,007	279	3,286	8%
7:15-8:15	NA	NA	NA	NA	17:15-18:15	NA	NA	NA	NA	7:15-8:15	2,400	493	2,893	17%	17:15-18:15	2,780	259	3,039	9%
7:30-8:30	NA	NA	NA	NA	17:30-18:30	NA	NA	NA	NA	7:30-8:30	2,454	489	2,943	17%	17:30-18:30	2,461	281	2,742	10%
7:45-8:45	NA	NA	NA	NA	17:45-18:45	NA	NA	NA	NA	7:45-8:45	2,276	465	2,741	17%	17:45-18:45	2,182	269	2,451	11%
8:00-9:00	NA	NA	NA	NA	18:00-19:00	NA	NA	NA	NA	8:00-9:00	1,980	460	2,450	19%	18:00-19:00	1,784	253	2,037	12%
Total	NA	NA	NA	NA	Total	NA	NA	NA	NA	Total	6,244	1,393	7,637	18%	Total	7,682	931	8,613	11%

Source: Parsons/HNTB analysis of data from KOA, Draft Report for SR-58 Origin and Destination Truck Study, January 26, 2009.

Note: NA or #VALUE! Indicates data not available.

**CENTENNIAL CORRIDOR PROJECT
EXISTING TRUCK VOLUMES AND PERCENTAGES
AT SR-58 MAINLINE**

SR 58 EB West of SR 99 - Spring "EBT+EBR"										SR 58 EB West of SR 99 - Fall "EBT+EBR"									
AM Peak					PM Peak					AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	NA	NA	NA		16:00-16:15	NA	NA	NA		6:00-6:15	77	12	89		16:00-16:15	224	24	248	
6:15-6:30	NA	NA	NA		16:15-16:30	NA	NA	NA		6:15-6:30	104	9	113		16:15-16:30	210	12	222	
6:30-6:45	NA	NA	NA		16:30-16:45	NA	NA	NA		6:30-6:45	124	12	136		16:30-16:45	247	13	260	
6:45-7:00	NA	NA	NA		16:45-17:00	NA	NA	NA		6:45-7:00	203	8	211		16:45-17:00	258	23	281	
7:00-7:15	NA	NA	NA		17:00-17:15	NA	NA	NA		7:00-7:15	186	9	195		17:00-17:15	248	16	264	
7:15-7:30	NA	NA	NA		17:15-17:30	NA	NA	NA		7:15-7:30	260	13	273		17:15-17:30	301	8	309	
7:30-7:45	NA	NA	NA		17:30-17:45	NA	NA	NA		7:30-7:45	268	14	282		17:30-17:45	286	9	295	
7:45-8:00	NA	NA	NA		17:45-18:00	NA	NA	NA		7:45-8:00	274	15	289		17:45-18:00	246	16	262	
8:00-8:15	NA	NA	NA		18:00-18:15	NA	NA	NA		8:00-8:15	213	22	235		18:00-18:15	236	15	251	
8:15-8:30	NA	NA	NA		18:15-18:30	NA	NA	NA		8:15-8:30	168	19	187		18:15-18:30	200	5	205	
8:30-8:45	NA	NA	NA		18:30-18:45	NA	NA	NA		8:30-8:45	142	25	167		18:30-18:45	234	3	237	
8:45-9:00	NA	NA	NA		18:45-19:00	NA	NA	NA		8:45-9:00	134	16	150		18:45-19:00	221	3	224	
6:00-7:00	NA	NA	NA	NA	16:00-17:00	NA	NA	NA	NA	6:00-7:00	508	41	549	7%	16:00-17:00	939	72	1,011	7%
6:15-7:15	NA	NA	NA	NA	16:15-17:15	NA	NA	NA	NA	6:15-7:15	617	38	655	6%	16:15-17:15	963	64	1,027	6%
6:30-7:30	NA	NA	NA	NA	16:30-17:30	NA	NA	NA	NA	6:30-7:30	773	42	815	5%	16:30-17:30	1,054	60	1,114	5%
6:45-7:45	NA	NA	NA	NA	16:45-17:45	NA	NA	NA	NA	6:45-7:45	917	44	961	5%	16:45-17:45	1,083	56	1,149	5%
7:00-8:00	NA	NA	NA	NA	17:00-18:00	NA	NA	NA	NA	7:00-8:00	988	51	1,039	5%	17:00-18:00	1,081	49	1,130	4%
7:15-8:15	NA	NA	NA	NA	17:15-18:15	NA	NA	NA	NA	7:15-8:15	1,015	64	1,079	6%	17:15-18:15	1,069	48	1,117	4%
7:30-8:30	NA	NA	NA	NA	17:30-18:30	NA	NA	NA	NA	7:30-8:30	923	70	993	7%	17:30-18:30	968	45	1,013	4%
7:45-8:45	NA	NA	NA	NA	17:45-18:45	NA	NA	NA	NA	7:45-8:45	797	81	878	9%	17:45-18:45	916	39	955	4%
8:00-9:00	NA	NA	NA	NA	18:00-19:00	NA	NA	NA	NA	8:00-9:00	657	82	739	11%	18:00-19:00	891	26	917	3%
Total	NA	NA	NA	NA	Total	NA	NA	NA	NA	Total	2,153	174	2,327	7%	Total	2,911	147	3,058	5%
SR 58 WB West of SR 99 - Spring "WBT"										SR 58 WB West of SR 99 - Fall "WBT"									
AM Peak					PM Peak					AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	177	19	196		16:00-16:15	468	15	483		6:00-6:15	73	11	84		16:00-16:15	294	3	297	
6:15-6:30	195	20	215		16:15-16:30	425	15	440		6:15-6:30	69	11	80		16:15-16:30	233	17	250	
6:30-6:45	252	29	281		16:30-16:45	441	32	473		6:30-6:45	107	17	124		16:30-16:45	285	7	292	
6:45-7:00	297	19	316		16:45-17:00	417	22	439		6:45-7:00	131	26	157		16:45-17:00	290	7	297	
7:00-7:15	270	32	302		17:00-17:15	488	21	509		7:00-7:15	110	17	127		17:00-17:15	288	11	299	
7:15-7:30	297	25	322		17:15-17:30	459	25	484		7:15-7:30	166	35	201		17:15-17:30	297	9	306	
7:30-7:45	218	19	237		17:30-17:45	441	8	449		7:30-7:45	200	22	222		17:30-17:45	225	2	227	
7:45-8:00	449	39	488		17:45-18:00	426	10	436		7:45-8:00	259	14	273		17:45-18:00	254	6	260	
8:00-8:15	324	28	352		18:00-18:15	387	20	407		8:00-8:15	241	14	255		18:00-18:15	194	9	203	
8:15-8:30	341	27	368		18:15-18:30	307	7	314		8:15-8:30	183	20	203		18:15-18:30	165	2	167	
8:30-8:45	309	38	347		18:30-18:45	291	7	298		8:30-8:45	182	15	197		18:30-18:45	122	6	128	
8:45-9:00	312	24	336		18:45-19:00	298	26	324		8:45-9:00	182	8	190		18:45-19:00	129	6	135	
6:00-7:00	921	87	1,008	9%	16:00-17:00	1,751	84	1,835	5%	6:00-7:00	380	65	445	15%	16:00-17:00	1,102	34	1,136	3%
6:15-7:15	1,014	100	1,114	9%	16:15-17:15	1,771	90	1,861	5%	6:15-7:15	417	71	488	15%	16:15-17:15	1,096	42	1,138	4%
6:30-7:30	1,116	105	1,221	9%	16:30-17:30	1,805	100	1,905	5%	6:30-7:30	514	95	609	16%	16:30-17:30	1,160	34	1,194	3%
6:45-7:45	1,082	95	1,177	8%	16:45-17:45	1,805	76	1,881	4%	6:45-7:45	607	100	707	14%	16:45-17:45	1,100	29	1,129	3%
7:00-8:00	1,234	115	1,349	9%	17:00-18:00	1,814	64	1,878	3%	7:00-8:00	735	88	823	11%	17:00-18:00	1,064	28	1,092	3%
7:15-8:15	1,288	111	1,399	8%	17:15-18:15	1,713	63	1,776	4%	7:15-8:15	866	85	951	9%	17:15-18:15	970	26	996	3%
7:30-8:30	1,332	113	1,445	8%	17:30-18:30	1,561	45	1,606	3%	7:30-8:30	863	70	933	7%	17:30-18:30	838	19	857	2%
7:45-8:45	1,423	132	1,555	8%	17:45-18:45	1,411	44	1,455	3%	7:45-8:45	865	63	928	7%	17:45-18:45	735	23	758	3%
8:00-9:00	1,286	117	1,403	8%	18:00-19:00	1,283	60	1,343	4%	8:00-9:00	788	57	845	7%	18:00-19:00	610	23	633	4%
Total	3,441	319	3,760	8%	Total	4,848	208	5,056	4%	Total	1,903	210	2,113	10%	Total	2,776	85	2,861	3%

ROSEDALE INTERCHANGE RAMPS

**CENTENNIAL CORRIDOR PROJECT
EXISTING TRUCK VOLUMES AND PERCENTAGES
AT ROSEDALE I/C RAMP**

SR 99 NB Off Rosedale - Spring "SR-99 NB off-ramp connector to SR-58 (NL+NR)"										SR 99 NB Off Rosedale - Fall "E/O SR-99 NB Off Ramps/Buck Owens Blvd & SR-58/Rosedale Hwy (NL)"									
AM Peak					PM Peak					AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	146	13	159		16:00-16:15	296	26	322		6:00-6:15	174	16	190		16:00-16:15	270	23	293	
6:15-6:30	196	15	211		16:15-16:30	312	24	336		6:15-6:30	226	17	243		16:15-16:30	408	22	430	
6:30-6:45	259	16	275		16:30-16:45	300	36	336		6:30-6:45	222	30	252		16:30-16:45	374	18	392	
6:45-7:00	283	19	302		16:45-17:00	277	22	299		6:45-7:00	378	25	403		16:45-17:00	432	29	461	
7:00-7:15	208	25	233		17:00-17:15	303	30	333		7:00-7:15	197	23	220		17:00-17:15	350	19	369	
7:15-7:30	278	23	301		17:15-17:30	301	24	325		7:15-7:30	245	18	263		17:15-17:30	425	19	444	
7:30-7:45	269	24	293		17:30-17:45	314	21	335		7:30-7:45	343	36	379		17:30-17:45	375	12	387	
7:45-8:00	335	18	353		17:45-18:00	291	22	313		7:45-8:00	366	20	386		17:45-18:00	405	17	422	
8:00-8:15	258	22	280		18:00-18:15	274	19	293		8:00-8:15	273	36	309		18:00-18:15	305	15	320	
8:15-8:30	254	31	285		18:15-18:30	312	17	329		8:15-8:30	258	42	300		18:15-18:30	316	16	332	
8:30-8:45	206	25	231		18:30-18:45	205	15	220		8:30-8:45	191	24	215		18:30-18:45	326	15	341	
8:45-9:00	251	23	274		18:45-19:00	181	13	194		8:45-9:00	242	39	281		18:45-19:00	225	9	234	
6:00-7:00	884	63	947	7%	16:00-17:00	1,185	108	1,293	8%	6:00-7:00	1,000	88	1,088	8%	16:00-17:00	1,484	92	1,576	6%
6:15-7:15	946	75	1,021	7%	16:15-17:15	1,192	112	1,304	9%	6:15-7:15	1,023	95	1,118	8%	16:15-17:15	1,564	88	1,652	5%
6:30-7:30	1,028	83	1,111	7%	16:30-17:30	1,181	112	1,293	9%	6:30-7:30	1,042	96	1,138	8%	16:30-17:30	1,581	85	1,666	5%
6:45-7:45	1,038	91	1,129	8%	16:45-17:45	1,195	97	1,292	8%	6:45-7:45	1,163	102	1,265	8%	16:45-17:45	1,582	79	1,661	5%
7:00-8:00	1,090	90	1,180	8%	17:00-18:00	1,209	97	1,306	7%	7:00-8:00	1,151	97	1,248	8%	17:00-18:00	1,555	67	1,622	4%
7:15-8:15	1,140	87	1,227	7%	17:15-18:15	1,180	86	1,266	7%	7:15-8:15	1,227	110	1,337	8%	17:15-18:15	1,510	63	1,573	4%
7:30-8:30	1,118	95	1,211	8%	17:30-18:30	1,191	79	1,270	6%	7:30-8:30	1,240	134	1,374	10%	17:30-18:30	1,401	60	1,461	4%
7:45-8:45	1,053	96	1,149	8%	17:45-18:45	1,082	73	1,155	6%	7:45-8:45	1,088	122	1,210	10%	17:45-18:45	1,352	63	1,415	4%
8:00-9:00	969	101	1,070	9%	18:00-19:00	972	64	1,036	6%	8:00-9:00	964	141	1,105	13%	18:00-19:00	1,172	55	1,227	4%
Total	2,943	254	3,197	8%	Total	3,366	269	3,635	7%	Total	3,115	326	3,441	9%	Total	4,211	214	4,425	5%

SR 99 SB Off - Spring "SR-99 SB Ramps & SR-58 (SL+SR)"										SR 99 SB Off - Fall "SR-99 SB On-Off Connector & SR-178 EB/Rosedale Hwy (SL+SR)"									
AM Peak					PM Peak					AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	41	5	46		16:00-16:15	116	13	129		6:00-6:15	59	5	64		16:00-16:15	108	15	123	
6:15-6:30	51	3	54		16:15-16:30	127	9	136		6:15-6:30	75	4	79		16:15-16:30	122	6	128	
6:30-6:45	51	4	55		16:30-16:45	92	7	99		6:30-6:45	90	5	95		16:30-16:45	84	8	92	
6:45-7:00	96	9	105		16:45-17:00	88	3	91		6:45-7:00	91	10	101		16:45-17:00	87	6	103	
7:00-7:15	45	9	54		17:00-17:15	101	5	106		7:00-7:15	36	10	46		17:00-17:15	87	8	95	
7:15-7:30	63	3	66		17:15-17:30	102	8	110		7:15-7:30	50	13	63		17:15-17:30	115	5	120	
7:30-7:45	86	11	97		17:30-17:45	109	8	117		7:30-7:45	61	9	70		17:30-17:45	78	4	82	
7:45-8:00	121	11	132		17:45-18:00	87	4	91		7:45-8:00	62	12	74		17:45-18:00	69	7	76	
8:00-8:15	95	9	104		18:00-18:15	92	3	95		8:00-8:15	66	10	76		18:00-18:15	85	4	89	
8:15-8:30	100	5	105		18:15-18:30	84	5	89		8:15-8:30	77	18	95		18:15-18:30	79	7	86	
8:30-8:45	86	6	94		18:30-18:45	67	8	75		8:30-8:45	92	7	99		18:30-18:45	77	7	84	
8:45-9:00	88	9	97		18:45-19:00	81	4	85		8:45-9:00	75	10	85		18:45-19:00	72	3	75	
6:00-7:00	239	21	260	8%	16:00-17:00	423	32	455	7%	6:00-7:00	315	24	339	7%	16:00-17:00	411	35	446	8%
6:15-7:15	243	25	268	9%	16:15-17:15	408	24	432	6%	6:15-7:15	292	29	321	9%	16:15-17:15	390	28	418	7%
6:30-7:30	255	25	280	9%	16:30-17:30	383	23	406	6%	6:30-7:30	267	38	305	12%	16:30-17:30	383	27	410	7%
6:45-7:45	290	32	322	10%	16:45-17:45	400	24	424	6%	6:45-7:45	238	42	280	15%	16:45-17:45	377	23	400	6%
7:00-8:00	315	34	349	10%	17:00-18:00	399	25	424	6%	7:00-8:00	209	44	253	17%	17:00-18:00	349	24	373	6%
7:15-8:15	365	34	399	9%	17:15-18:15	390	23	413	6%	7:15-8:15	239	44	283	16%	17:15-18:15	347	20	367	5%
7:30-8:30	402	36	438	8%	17:30-18:30	372	20	392	5%	7:30-8:30	266	49	315	16%	17:30-18:30	311	22	333	7%
7:45-8:45	402	33	435	8%	17:45-18:45	330	20	350	6%	7:45-8:45	297	47	344	14%	17:45-18:45	310	25	335	7%
8:00-9:00	369	31	400	8%	18:00-19:00	324	20	344	6%	8:00-9:00	310	45	355	13%	18:00-19:00	313	21	334	6%
Total	923	86	1,009	9%	Total	1,146	77	1,223	6%	Total	834	113	947	12%	Total	1,073	80	1,153	7%

Source: Parsons/HNTB analysis of data from KOA, Draft Report for SR-58 Origin and Destination Truck Study, January 26, 2009.

Note: NA or #VALUE! Indicates data not available.

**CENTENNIAL CORRIDOR PROJECT
EXISTING TRUCK VOLUMES AND PERCENTAGES
AT ROSEDALE I/C RAMP**

SR 99 NB Off Buck Owens - Spring "SR-99 NB Ramps/Sillect Ave & Buck Owens (EL+ET+ER)"					SR 99 NB Off Buck Owens - Fall "SR-99 NB On-Off Ramps/Sillect Ave & Buck Owens Blvd (EL+ET+ER)"				
AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	50	9	59		16:00-16:15	64	14	78	
6:15-6:30	56	13	69		16:15-16:30	50	9	59	
6:30-6:45	94	11	105		16:30-16:45	66	11	77	
6:45-7:00	162	12	174		16:45-17:00	54	8	62	
7:00-7:15	91	14	105		17:00-17:15	57	10	67	
7:15-7:30	109	14	123		17:15-17:30	46	11	57	
7:30-7:45	115	12	127		17:30-17:45	45	13	58	
7:45-8:00	196	12	208		17:45-18:00	41	6	47	
8:00-8:15	122	23	145		18:00-18:15	50	6	56	
8:15-8:30	60	4	64		18:15-18:30	24	6	30	
8:30-8:45	101	21	122		18:30-18:45	30	7	37	
8:45-9:00	91	9	100		18:45-19:00	34	6	40	
<hr/>					<hr/>				
6:00-7:00	362	45	407	11%	16:00-17:00	234	42	276	15%
6:15-7:15	403	50	453	11%	16:15-17:15	227	38	265	14%
6:30-7:30	456	51	507	10%	16:30-17:30	223	40	263	15%
6:45-7:45	477	52	529	10%	16:45-17:45	202	42	244	17%
7:00-8:00	511	52	563	9%	17:00-18:00	189	40	229	17%
7:15-8:15	542	61	603	10%	17:15-18:15	182	36	218	17%
7:30-8:30	493	51	544	9%	17:30-18:30	160	31	191	16%
7:45-8:45	479	60	539	11%	17:45-18:45	145	25	170	15%
8:00-9:00	374	57	431	13%	18:00-19:00	138	25	163	15%
Total	1,247	154	1,401	11%	Total	561	107	668	16%
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SR 99 SB On Diagonal - Spring "SR-99 SB Ramps & SR-58 (ER)"					SR 99 SB On Diagonal - Fall "SR-99 SB On-Off Connector & SR-178 EB/Rosedale Hwy (ER)"				
AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	88	28	116		16:00-16:15	263	16	279	
6:15-6:30	110	33	143		16:15-16:30	257	20	277	
6:30-6:45	119	46	165		16:30-16:45	283	25	308	
6:45-7:00	147	42	189		16:45-17:00	227	19	246	
7:00-7:15	110	19	129		17:00-17:15	291	15	306	
7:15-7:30	191	28	219		17:15-17:30	246	12	258	
7:30-7:45	195	26	221		17:30-17:45	217	17	234	
7:45-8:00	158	17	175		17:45-18:00	194	16	210	
8:00-8:15	162	23	185		18:00-18:15	176	16	192	
8:15-8:30	138	17	155		18:15-18:30	178	13	191	
8:30-8:45	150	19	169		18:30-18:45	283	25	308	
8:45-9:00	134	21	155		18:45-19:00	139	12	151	
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6:00-7:00	464	149	613	24%	16:00-17:00	1,030	80	1,110	7%
6:15-7:15	486	140	626	22%	16:15-17:15	1,058	79	1,137	7%
6:30-7:30	567	135	702	19%	16:30-17:30	1,047	71	1,118	6%
6:45-7:45	643	115	758	15%	16:45-17:45	981	63	1,044	6%
7:00-8:00	654	90	744	12%	17:00-18:00	948	60	1,008	6%
7:15-8:15	706	94	800	12%	17:15-18:15	833	61	894	7%
7:30-8:30	653	83	736	11%	17:30-18:30	765	62	827	7%
7:45-8:45	608	76	684	11%	17:45-18:45	831	70	901	8%
8:00-9:00	584	80	664	12%	18:00-19:00	776	66	842	8%
Total	1,702	319	2,021	16%	Total	2,754	206	2,960	7%
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AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	71	24	95		16:00-16:15	205	36	241	
6:15-6:30	141	29	170		16:15-16:30	168	32	200	
6:30-6:45	170	42	212		16:30-16:45	188	23	211	
6:45-7:00	210	31	241		16:45-17:00	225	25	250	
7:00-7:15	52	34	86		17:00-17:15	298	16	314	
7:15-7:30	93	21	114		17:15-17:30	209	13	222	
7:30-7:45	109	29	138		17:30-17:45	171	15	186	
7:45-8:00	129	23	152		17:45-18:00	175	11	186	
8:00-8:15	139	26	165		18:00-18:15	172	22	194	
8:15-8:30	86	28	114		18:15-18:30	185	22	207	
8:30-8:45	127	24	151		18:30-18:45	166	5	171	
8:45-9:00	126	28	154		18:45-19:00	181	11	192	
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6:00-7:00	592	126	718	18%	16:00-17:00	786	116	902	13%
6:15-7:15	573	136	709	19%	16:15-17:15	879	96	975	10%
6:30-7:30	525	128	653	20%	16:30-17:30	920	77	997	8%
6:45-7:45	464	115	579	20%	16:45-17:45	903	69	972	7%
7:00-8:00	383	107	490	22%	17:00-18:00	853	55	908	6%
7:15-8:15	470	99	569	17%	17:15-18:15	727	61	788	8%
7:30-8:30	483	106	589	19%	17:30-18:30	703	70	773	9%
7:45-8:45	481	101	582	17%	17:45-18:45	698	60	758	8%
8:00-9:00	478	106	584	18%	18:00-19:00	704	60	764	8%
Total	1,453	339	1,792	19%	Total	2,343	231	2,574	9%

**CENTENNIAL CORRIDOR PROJECT
EXISTING TRUCK VOLUMES AND PERCENTAGES
AT ROSEDALE I/C RAMP**

SR 99 NB On - Spring "SR-99 NB Ramps/Sillect Ave & Buck Owens (NL+SR+WT)"										SR 99 NB On - Fall "SR-99 NB On-Off Ramps/Sillect Ave & Buck Owens Blvd (NL+SR+WT)"									
AM Peak					PM Peak					AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	39	18	57		16:00-16:15	107	14	121		6:00-6:15	26	8	34		16:00-16:15	142	1	143	
6:15-6:30	33	6	39		16:15-16:30	88	10	98		6:15-6:30	47	15	62		16:15-16:30	176	2	178	
6:30-6:45	31	12	43		16:30-16:45	104	11	115		6:30-6:45	83	6	89		16:30-16:45	118	2	120	
6:45-7:00	62	9	71		16:45-17:00	88	5	93		6:45-7:00	31	31	82		16:45-17:00	84	0	84	
7:00-7:15	50	11	61		17:00-17:15	128	12	140		7:00-7:15	90	13	103		17:00-17:15	108	3	111	
7:15-7:30	36	14	50		17:15-17:30	93	8	101		7:15-7:30	55	16	71		17:15-17:30	118	0	118	
7:30-7:45	64	12	76		17:30-17:45	76	6	82		7:30-7:45	50	5	55		17:30-17:45	97	1	98	
7:45-8:00	70	12	82		17:45-18:00	77	12	89		7:45-8:00	60	8	68		17:45-18:00	80	2	82	
8:00-8:15	46	10	56		18:00-18:15	98	7	105		8:00-8:15	50	23	73		18:00-18:15	50	0	50	
8:15-8:30	40	17	57		18:15-18:30	50	3	53		8:15-8:30	46	13	59		18:15-18:30	29	6	35	
8:30-8:45	70	14	84		18:30-18:45	52	6	58		8:30-8:45	35	8	43		18:30-18:45	54	1	55	
8:45-9:00	65	12	77		18:45-19:00	49	4	53		8:45-9:00	43	13	56		18:45-19:00	47	2	49	
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6:00-7:00	165	45	210	21%	16:00-17:00	387	40	427	9%	6:00-7:00	187	60	247	24%	16:00-17:00	520	5	525	1%
6:15-7:15	176	38	214	18%	16:15-17:15	408	38	446	9%	6:15-7:15	251	65	316	21%	16:15-17:15	486	7	493	1%
6:30-7:30	179	46	225	20%	16:30-17:30	413	36	449	8%	6:30-7:30	259	66	325	20%	16:30-17:30	428	5	433	1%
6:45-7:45	212	46	258	18%	16:45-17:45	385	31	416	7%	6:45-7:45	226	65	291	22%	16:45-17:45	407	4	411	1%
7:00-8:00	220	49	269	18%	17:00-18:00	374	38	412	9%	7:00-8:00	255	42	297	14%	17:00-18:00	403	6	409	1%
7:15-8:15	216	48	264	18%	17:15-18:15	344	33	377	9%	7:15-8:15	215	52	267	19%	17:15-18:15	345	3	348	1%
7:30-8:30	220	51	271	19%	17:30-18:30	301	28	329	9%	7:30-8:30	206	49	255	19%	17:30-18:30	256	9	265	3%
7:45-8:45	226	53	279	19%	17:45-18:45	277	28	305	9%	7:45-8:45	191	52	243	21%	17:45-18:45	213	9	222	4%
8:00-9:00	221	53	274	19%	18:00-19:00	249	20	269	7%	8:00-9:00	174	57	231	25%	18:00-19:00	180	9	189	5%
Total	606	147	753	20%	Total	1,010	98	1,108	9%	Total	616	159	775	21%	Total	1,103	20	1,123	2%
<hr/>										<hr/>									
SR 99 SB On Loop - Spring "SR-99 SB Ramps & SR-58 (WR)"										SR 99 SB On Loop - Fall "SR-99 SB On-Off Connector & SR-178 EB/Rosedale Hwy (WR)"									
AM Peak					PM Peak					AM Peak					PM Peak				
Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%	Time Period	Cars	Trucks	Total	%
6:00-6:15	48	8	56		16:00-16:15	226	12	238		6:00-6:15	73	13	86		16:00-16:15	138	5	143	
6:15-6:30	80	10	90		16:15-16:30	198	12	210		6:15-6:30	85	5	90		16:15-16:30	177	5	182	
6:30-6:45	108	12	120		16:30-16:45	209	15	224		6:30-6:45	99	19	118		16:30-16:45	194	12	206	
6:45-7:00	99	9	108		16:45-17:00	210	8	218		6:45-7:00	120	17	137		16:45-17:00	218	4	222	
7:00-7:15	120	14	134		17:00-17:15	226	8	234		7:00-7:15	48	33	81		17:00-17:15	223	8	231	
7:15-7:30	166	13	179		17:15-17:30	210	10	220		7:15-7:30	52	31	83		17:15-17:30	211	8	219	
7:30-7:45	145	9	154		17:30-17:45	192	10	202		7:30-7:45	72	24	96		17:30-17:45	187	8	195	
7:45-8:00	125	12	137		17:45-18:00	172	9	181		7:45-8:00	103	15	118		17:45-18:00	181	8	189	
8:00-8:15	179	13	192		18:00-18:15	171	10	181		8:00-8:15	118	16	134		18:00-18:15	151	8	159	
8:15-8:30	154	24	178		18:15-18:30	146	8	154		8:15-8:30	154	9	163		18:15-18:30	155	8	163	
8:30-8:45	147	11	158		18:30-18:45	163	9	172		8:30-8:45	118	10	128		18:30-18:45	122	9	131	
8:45-9:00	125	21	146		18:45-19:00	130	16	146		8:45-9:00	107	8	115		18:45-19:00	160	4	164	
<hr/>					<hr/>					<hr/>					<hr/>				
6:00-7:00	335	39	374	10%	16:00-17:00	843	47	890	5%	6:00-7:00	377	54	431	13%	16:00-17:00	727	26	753	3%
6:15-7:15	407	45	452	10%	16:15-17:15	843	43	886	5%	6:15-7:15	352	74	426	17%	16:15-17:15	812	28	841	3%
6:30-7:30	493	48	541	9%	16:30-17:30	855	41	896	5%	6:30-7:30	319	100	419	24%	16:30-17:30	846	32	878	4%
6:45-7:45	530	45	575	8%	16:45-17:45	838	36	874	4%	6:45-7:45	292	105	397	26%	16:45-17:45	839	28	867	3%
7:00-8:00	556	48	604	8%	17:00-18:00	800	37	837	4%	7:00-8:00	275	103	378	27%	17:00-18:00	802	32	834	4%
7:15-8:15	615	47	662	7%	17:15-18:15	745	39	784	5%	7:15-8:15	345	86	431	20%	17:15-18:15	730	32	762	4%
7:30-8:30	603	58	661	9%	17:30-18:30	681	37	718	5%	7:30-8:30	447	64	511	13%	17:30-18:30	674	32	706	5%
7:45-8:45	605	60	665	9%	17:45-18:45	652	36	688	5%	7:45-8:45	493	50	543	9%	17:45-18:45	609	33	642	5%
8:00-9:00	605	69	674	10%	18:00-19:00	610	43	653	7%	8:00-9:00	497	43	540	8%	18:00-19:00	588	29	617	5%
Total	1,496	156	1,652	9%	Total	2,253	127	2,380	5%	Total	1,149	200	1,349	15%	Total	2,117	87	2,204	4%

CENTENNIAL CORRIDOR PROJECT
EXISTING VOLUMES (2007/2008)

TABLE 1

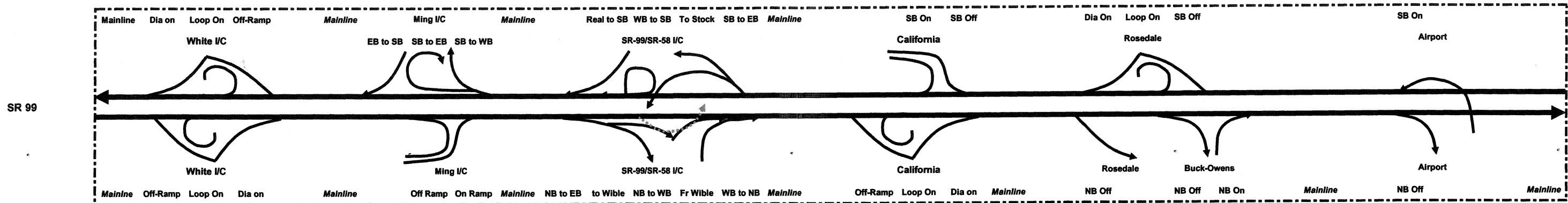
LOCATION	EXISTING (2007/2008) COUNTS							
	AM Peak				PM Peak			
	Cars	Trucks	Total Volume	Truck %	Cars	Trucks	Total Volume	Truck %
<u>SR-99 Mainline NB (North of Airport)</u>	<u>1,292</u>	<u>722</u>	<u>2,014</u>	<u>36%</u>	<u>1,991</u>	<u>485</u>	<u>2,476</u>	<u>20%</u>
SR 99 Airport NB Off	1,383	120	1,503	8%	1,104	96	1,200	8%
<u>SR-99 Mainline NB (Bet. Rosedale & Airport)</u>	<u>2,674</u>	<u>843</u>	<u>3,517</u>	<u>24%</u>	<u>3,095</u>	<u>581</u>	<u>3,676</u>	<u>16%</u>
SR 99 Buck-Owens NB On	224	42	266	16%	527	5	532	1%
SR 99 Buck-Owens NB Off	671	28	699	4%	213	63	276	23%
SR 99 Rosedale NB Off	1,633	97	1,730	6%	1,668	92	1,760	5%
<u>SR-99 Mainline NB (Bet. California & Rosedale)</u>	<u>4,754</u>	<u>926</u>	<u>5,680</u>	<u>16%</u>	<u>4,449</u>	<u>731</u>	<u>5,180</u>	<u>14%</u>
SR 99 California NB On (Diagonal)	236	21	257	8%	196	17	213	8%
SR 99 California NB On (Loop)	431	38	469	8%	579	50	629	8%
SR 99 California NB Off	972	84	1,056	8%	624	54	678	8%
<u>SR-99 Mainline NB (Bet. SR-58 & California)</u>	<u>5,058</u>	<u>952</u>	<u>6,010</u>	<u>16%</u>	<u>4,298</u>	<u>718</u>	<u>5,016</u>	<u>14%</u>
SR 99 NB On from SR-58 WB	811	277	1,088	25%	793	291	1,084	27%
SR 99 NB Off to SR-58 EB	1,355	156	1,511	10%	1,092	97	1,189	8%
SR 99 NB On from Wible	505	0	505	0%	555	0	555	0%
SR 99 NB Off to Wible Road	248	0	248	0%	268	0	268	0%
<u>SR-99 Mainline NB (Bet. Ming & SR-58)</u>	<u>5,345</u>	<u>831</u>	<u>6,176</u>	<u>13%</u>	<u>4,310</u>	<u>524</u>	<u>4,834</u>	<u>11%</u>
SR 99 Ming NB On (Diagonal)	1,181	103	1,284	8%	1,134	99	1,233	8%
SR 99 Ming NB Off	282	24	306	8%	374	32	406	8%
<u>SR-99 Mainline NB (Bet. White & Ming)</u>	<u>4,443</u>	<u>753</u>	<u>5,196</u>	<u>14%</u>	<u>3,549</u>	<u>458</u>	<u>4,007</u>	<u>11%</u>
SR 99 White NB On (Diagonal)	640	41	681	6%	430	27	457	6%
SR 99 White NB On (Loop)	1,434	92	1,525	6%	1,086	69	1,155	6%
SR 99 White NB Off	192	12	204	6%	318	20	338	6%
<u>SR-99 Mainline NB (South of White)</u>	<u>2,561</u>	<u>633</u>	<u>3,194</u>	<u>20%</u>	<u>2,352</u>	<u>381</u>	<u>2,733</u>	<u>14%</u>
<u>SR-99 Mainline SB (North of Airport)</u>	<u>1,447</u>	<u>627</u>	<u>2,074</u>	<u>30%</u>	<u>2,416</u>	<u>734</u>	<u>3,150</u>	<u>23%</u>
SR 99 Airport SB On	1,020	89	1,109	8%	1,513	132	1,645	8%
<u>SR-99 Mainline SB (Bet. Airport & Rosedale)</u>	<u>2,467</u>	<u>716</u>	<u>3,183</u>	<u>22%</u>	<u>3,929</u>	<u>866</u>	<u>4,795</u>	<u>18%</u>
SR 99 Rosedale SB Off	541	44	585	8%	598	35	633	6%
SR 99 Rosedale SB On (Loop)	595	103	698	15%	1,241	26	1,267	2%
SR 99 Rosedale SB On (Diagonal)	810	107	917	12%	1,075	116	1,191	10%
<u>SR-99 Mainline SB (Bet. Rosedale & California)</u>	<u>3,331</u>	<u>882</u>	<u>4,213</u>	<u>21%</u>	<u>5,647</u>	<u>973</u>	<u>6,620</u>	<u>15%</u>
SR 99 California SB Off	908	79	987	8%	945	82	1,027	8%
SR 99 California SB On (loop)	293	25	318	8%	777	68	845	8%
<u>SR-99 Mainline SB (Bet. California & SR-58)</u>	<u>2,716</u>	<u>828</u>	<u>3,544</u>	<u>23%</u>	<u>5,480</u>	<u>958</u>	<u>6,438</u>	<u>15%</u>
SR 99 SB Off to SR-58 EB	869	227	1,096	21%	1,102	348	1,450	24%
SR 99 SB On from SR-58 WB	797	136	933	15%	1,112	12	1,124	1%
SR 99 SB Off to Stockdale Hwy	349	0	349	0%	446	0	446	0%
SR 99 SB On from Real Road	243	12	255	5%	252	19	271	7%
<u>SR-99 Mainline SB (Bet. SR-58 & Ming)</u>	<u>2,571</u>	<u>716</u>	<u>3,287</u>	<u>22%</u>	<u>5,234</u>	<u>703</u>	<u>5,937</u>	<u>12%</u>
SR 99 Ming SB Off to WB & EB	729	63	792	8%	1,432	125	1,557	8%
SR 99 Ming SB Off to WB	470	41	511	8%	805	70	875	8%
SR 99 Ming SB Off to EB	259	22	281	8%	627	55	682	8%
SR 99 Ming SB On (Diagonal)	224	20	244	8%	421	37	458	8%
<u>SR-99 Mainline SB (Bet. Ming & White)</u>	<u>2,130</u>	<u>609</u>	<u>2,739</u>	<u>22%</u>	<u>4,347</u>	<u>491</u>	<u>4,838</u>	<u>10%</u>
SR 99 White SB Off	1,285	82	1,367	6%	1,898	121	2,019	6%
SR 99 White SB On (Loop)	101	6	107	6%	124	8	132	6%
SR 99 White SB On (Diagonal)	132	8	140	6%	125	8	133	6%
<u>SR-99 Mainline SB (South of White)</u>	<u>1,077</u>	<u>542</u>	<u>1,619</u>	<u>33%</u>	<u>2,699</u>	<u>385</u>	<u>3,084</u>	<u>12%</u>
<u>SR-58 Mainline EB (Bet. Real Road & Off Ramp to SR-99 SB)</u>	<u>1,150</u>	<u>51</u>	<u>1,201</u>	<u>4%</u>	<u>1,004</u>	<u>72</u>	<u>1,076</u>	<u>7%</u>
Real Road Off to 99 SB	243	12	255	5%	252	19	271	7%
SR 58 On Ramp from 99 SB	869	227	1,096	21%	1,102	348	1,450	24%
SR 58 On Ramp from 99 NB	1,355	156	1,511	10%	1,092	97	1,189	8%
<u>SR-58 Mainline EB (Bet. SR-99 after ramps & H Street)</u>	<u>3,131</u>	<u>422</u>	<u>3,553</u>	<u>12%</u>	<u>2,946</u>	<u>498</u>	<u>3,444</u>	<u>14%</u>
SR 58 H Street EB Off	385	25	410	6%	376	24	400	6%
SR 58 Chester EB On	445	28	473	6%	527	34	561	6%
<u>SR-58 Mainline EB (Bet. H Street & Union)</u>	<u>3,190</u>	<u>426</u>	<u>3,616</u>	<u>12%</u>	<u>3,097</u>	<u>508</u>	<u>3,605</u>	<u>14%</u>
SR 58 Union EB Off Ramp	775	49	824	6%	528	34	562	6%
SR 58 Union EB On Ramp (Loop)	163	10	173	6%	211	13	224	6%
SR 58 Union EB On Ramp (Diagonal)	185	12	197	6%	224	14	238	6%
<u>SR-58 Mainline EB (Bet. Union & Cottonwood)</u>	<u>2,763</u>	<u>399</u>	<u>3,162</u>	<u>13%</u>	<u>3,003</u>	<u>502</u>	<u>3,505</u>	<u>14%</u>
<u>SR-58 Mainline WB (Bet. Cottonwood & Union)</u>	<u>2,688</u>	<u>456</u>	<u>3,144</u>	<u>15%</u>	<u>2,632</u>	<u>415</u>	<u>3,047</u>	<u>14%</u>
SR 58 Brundage WB Off Ramp	465	30	495	6%	317	20	337	6%
SR 58 Brundage WB On Ramp	175	11	186	6%	228	15	243	6%
SR 58 Union WB On Ramp	227	14	241	6%	333	21	354	6%
<u>SR-58 Mainline WB (Bet. Union & H Street)</u>	<u>2,616</u>	<u>460</u>	<u>3,076</u>	<u>15%</u>	<u>2,907</u>	<u>400</u>	<u>3,307</u>	<u>12%</u>
SR 58 Chester WB Off	431	28	459	6%	429	27	456	6%
SR 58 H Street WB On	313	20	333	6%	437	28	465	6%
<u>SR-58 Mainline WB (Bet. H Street & SR-99)</u>	<u>2,482</u>	<u>468</u>	<u>2,950</u>	<u>16%</u>	<u>2,917</u>	<u>399</u>	<u>3,316</u>	<u>12%</u>
SR 58 WB Off to SR-99 NB	811	277	1,088	25%	793	291	1,084	27%
SR 58 WB Off to SR-99 SB	797	136	933	15%	1,112	12	1,124	1%
<u>SR-58 Mainline WB (Bet. Real Road & SR-99 SB On)</u>	<u>841</u>	<u>88</u>	<u>929</u>	<u>9%</u>	<u>1,074</u>	<u>34</u>	<u>1,108</u>	<u>3%</u>

XXXX Control numbers from KOA O-D Study (Fall Data)

Table 2
CENTENNIAL CORRIDOR PROJECT
EXISTING FREEWAY AND RAMP VOLUMES - SR 99

Existing																								
AM	Cars	1,077	132	101	1,285	2,130	224	259	470	2,571	243	797	349	869	2,716	293	908	3,331	810	595	541	2,467	1,020	1,447
	Trucks	542	8	6	82	609	20	22	41	716	12	136	0	227	828	25	79	882	107	103	44	716	89	627
	Total	1,619	140	107	1,367	2,739	244	281	511	3,287	255	933	349	1,096	3,544	318	987	4,213	917	698	585	3,183	1,109	2,074
PM	Cars	2,699	125	124	1,898	4,347	421	627	805	5,234	252	1,112	446	1,102	5,480	777	945	5,647	1,075	1,241	598	3,929	1,513	2,416
	Trucks	385	8	8	121	491	37	55	70	703	19	12	0	348	958	68	82	973	116	26	35	866	132	734
	Total	3,084	133	132	2,019	4,838	458	682	875	5,937	271	1,124	446	1,450	6,438	845	1,027	6,620	1,191	1,267	633	4,795	1,645	3,150

SOUTHBOUND



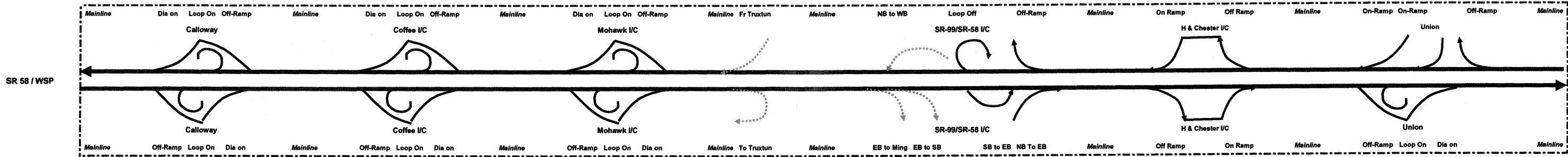
NORTHBOUND

Existing																								
AM	Cars	2,561	192	1,434	640	4,443	282	1,181	5,345	1,355	248	505	811	5,058	972	431	236	4,754	1,633	671	224	2,674	1,383	1,292
	Trucks	633	12	92	41	753	24	103	831	156	0	0	277	952	84	38	21	926	97	28	42	843	120	722
	Total	3,194	204	1,525	681	5,196	306	1,284	6,176	1,511	248	505	1,088	6,010	1,056	469	257	5,680	1,730	699	266	3,517	1,503	2,014
		3,517																						
PM	Cars	2,352	318	1,086	430	3,549	374	1,134	4,310	1,092	268	555	793	4,298	624	579	196	4,449	1,668	213	527	3,095	1,104	1,991
	Trucks	381	20	69	27	458	32	99	524	97	0	0	291	718	54	50	17	731	92	63	5	581	96	485
	Total	2,733	338	1,155	457	4,007	406	1,233	4,834	1,189	268	555	1,084	5,016	678	629	213	5,180	1,760	276	532	3,676	1,200	2,476

Table 3
CENTENNIAL CORRIDOR PROJECT
EXISTING FREEWAY AND RAMP VOLUMES - SR 58

WSP		Existing											
AM	Cars	Cars	841	797	811	2,482	313	431	2,616	227	175	465	2,688
	Trucks	Trucks	88	136	277	468	20	28	460	14	11	30	456
	Total	Total	929	933	1,088	2,950	333	459	3,076	241	186	495	3,144
PM	Cars	Cars	1,074	1,112	793	2,917	437	429	2,907	333	228	317	2,632
	Trucks	Trucks	34	12	291	399	28	27	400	21	15	20	415
	Total	Total	1,108	1,124	1,084	3,316	465	456	3,307	354	243	337	3,047

WESTBOUND



EASTBOUND

WSP		Existing												
AM	Cars	Cars	1,150	243	869	1,355	3,131	385	445	3,190	775	163	185	2,763
	Trucks	Trucks	51	12	227	156	422	25	28	426	49	10	12	399
	Total	Total	1,201	255	1,096	1,511	3,553	410	473	3,616	824	173	197	3,162
PM	Cars	Cars	1,004	252	1,102	1,092	2,946	376	527	3,097	528	211	224	3,003
	Trucks	Trucks	72	19	348	97	498	24	34	508	34	13	14	502
	Total	Total	1,076	271	1,450	1,189	3,444	400	561	3,605	562	224	238	3,505

CORSIM CALIBRATION

- **Existing Conditions Model Calibration Process**
- **Origin–Destination Volume Table**
- **Variation of Global/Local Parameters (AM and PM)**
- **Variation of Local Parameters with Truck Lanes On and Off**
- **Calibrated Intersection Level of Service Sample**

EXISTING CORSIM CALIBRATION

EXISTING CONDITIONS MODEL CALIBRATION PROCESS

Network set up:

- The existing AM and PM Centennial CORSIM models were obtained from a previous study which already has an AM and PM CORSIM models developed. The freeway network in these two previously developed models consisted of Highway 99 between White Lane and Olive Drive, and SR-58 between Real Road and Union Avenue. In addition, the surface street network in these models generally consisted of ramp terminal intersections and intersections that are immediately adjacent to the ramp terminals intersections.
- The freeway and surface street network coding in and around the Olive Drive area were eliminated in the existing AM and PM Centennial CORSIM models. Coding verifications and further network setup were then conducted on the following aspects:
 - Speed
 - Lane configurations
 - Signal phasing and timings
 - Volumes (freeway and intersection)
 - Truck percentages
 - Origin-Destination volume input
 - Conditional movements
 - Lane and turning restrictions
 - Sink and source
- For reporting purposes, a dummy HOV lane was added to the freeway network for both the northbound and southbound directions along Highway 99, such that statistics from simulations can be extracted on a per lane basis for analysis without the use of adding detectors which was an alternative to this method.
- References to the following documents were used in the setup of the CORSIM models:
 - 2009 posted speed map from the City of Bakersfield website
 - Figure 2 Peak Hour Freeway Volumes Existing Conditions of Fehr and Peers technical memorandum *Centennial Corridor Existing Conditions Analysis Results Updated Based on TRIP/Caltrans Comments* dated April 22, 2010.
 - HCM Signalized Intersection Capacity Analysis AM peak hour and PM peak hour reports from Fehr and Peers Existing Conditions Synchro analysis.

- Figures XA, XB, and XC Peak Hour Traffic Volumes And Lane Configurations Existing Conditions provided by Fehr and Peers

Calibration Goals:

- Global – Freeway operations were calibrated to the level of service, density, and speed results depicted in the following tables from Fehr and Peers technical memorandum *Centennial Corridor Existing Conditions Analysis Results Updated Based on TRIP/Caltrans Comments* dated April 22, 2010:
 - Table 1 – Freeway Mainline and Ramp Junction Level of Service Existing Conditions: SR-58 Eastbound
 - Table 2 – Freeway Mainline and Ramp Junction Level of Service Existing Conditions: SR-58 Westbound
 - Table 3 – Freeway Mainline and Ramp Junction Level of Service Existing Conditions: SR-99 Northbound
 - Table 4 – Freeway Mainline and Ramp Junction Level of Service Existing Conditions: SR-99 Southbound
- Local – Intersections operations were calibrated to the level of service and delay results shown in Table 1A Existing AM Conditions (Updated 4.14.10) Intersection Level of Service Analysis and Table 1B Existing PM Conditions (Updated 4.14.10) Intersection Level of Service Analysis provided by Fehr and Peers.
- Queuing conditions – Localized queuing conditions in the models were replicated according to field conditions such as Highway 99 northbound off-ramp to eastbound along Rosedale Highway towards Oak Street in the AM peak hour and westbound on Rosedale Highway towards Highway 99 southbound on-ramp in the PM peak hour.

Calibration Runs:

- Global parameters: vehicle entry headway, car following sensitivity, and Pitt car following constant were tested individually and in combinations as listed in the following table:

File Name Ends with	Global Parameters		
	Vehicle Entry Headway	Car Following Sensitivity	Pitt Car Following Constant
default	Constant Headway		
normal	Normal Distribution		
erlang1	Erlang Distribution Shape Parameter alpha=1		
erlang2	Erlang Distribution Shape Parameter alpha=2		
erlang3	Erlang Distribution Shape Parameter alpha=3		
erlang4	Erlang Distribution Shape Parameter alpha=4		
erlang5	Erlang Distribution Shape Parameter alpha=5		
erlang6	Erlang Distribution Shape Parameter alpha=6		
erlang7	Erlang Distribution Shape Parameter alpha=7		
erlang8	Erlang Distribution Shape Parameter alpha=8		
erlang9	Erlang Distribution Shape Parameter alpha=9		
CFS-1%+1%		-1% (1 to 5) +1% (6 to 10)	
CFS-2%+2%		-2% (1 to 5) +2% (6 to 10)	
CFS-3%+3%		-3% (1 to 5) +3% (6 to 10)	
CFS-4%+4%		-4% (1 to 5) +4% (6 to 10)	
CFS-5%+5%		-5% (1 to 5) +5% (6 to 10)	
CFS-6%+6%		-6% (1 to 5) +6% (6 to 10)	
CFS-7%+7%		-7% (1 to 5) +7% (6 to 10)	
CFS+10%		10%	
CFS+20%		20%	
CFS+30%		30%	
CFS+40%		40%	
CFS+50%		50%	
CFS+60%		60%	
CFS-10%		-10%	
CFS-20%		-20%	
CFS-30%		-30%	
CFS-40%		-40%	
CFS-50%		-50%	
CFS-60%		-60%	
CFS-70%		-70%	
CFS-80%		-80%	
CFS-90%		-90%	
PCFC-10%			9 ft
PCFC-20%			8 ft
PCFC-30%			7 ft
PCFC-40%			6 ft
PCFC-50%			5 ft
PCFC-60%			4 ft
PCFC-70%			3 ft
CFS+10%_PCFC-10%_normal	Normal Distribution	10%	9 ft
CFS+10%_PCFC-30%_normal	Normal Distribution	10%	7 ft
CFS+10%_PCFC-50%_normal	Normal Distribution	10%	5 ft
CFS+30%_PCFC-10%_normal	Normal Distribution	30%	9 ft
CFS+30%_PCFC-30%_normal	Normal Distribution	30%	7 ft
CFS+30%_PCFC-50%_normal	Normal Distribution	30%	5 ft
CFS+50%_PCFC-10%_normal	Normal Distribution	50%	9 ft
CFS+50%_PCFC-30%_normal	Normal Distribution	50%	7 ft
CFS+50%_PCFC-50%_normal	Normal Distribution	50%	5 ft
CFS-10%_PCFC-10%_normal	Normal Distribution	-10%	9 ft
CFS-10%_PCFC-30%_normal	Normal Distribution	-10%	7 ft
CFS-10%_PCFC-50%_normal	Normal Distribution	-10%	5 ft
CFS-30%_PCFC-10%_normal	Normal Distribution	-30%	9 ft
CFS-30%_PCFC-30%_normal	Normal Distribution	-30%	7 ft
CFS-30%_PCFC-50%_normal	Normal Distribution	-30%	5 ft
CFS-50%_PCFC-10%_normal	Normal Distribution	-50%	9 ft
CFS-50%_PCFC-30%_normal	Normal Distribution	-50%	7 ft
CFS-50%_PCFC-50%_normal	Normal Distribution	-50%	5 ft

- Mainline results for each AM and PM individual and combination global parameter model runs were summarized. (58 AM runs and 58 PM runs).
- Selection of the best run among all global parameter runs were based on speed, density, level of service, and cumulative travel time along Highway 99 for both the northbound and southbound directions. Existing speed, density, and level of service along Highway 99 were available for comparison from Fehr and Peers technical memorandum as stated previously, but there is no field travel time data for the studied section of Highway 99, as such free flow travel time was calculated based on distance and posted speed.
- Global parameter results comparison was summarized in the attached tables; the selected global parameter run is highlighted in yellow and was used for local parameter calibration.

Runs ID	Global Parameters		
	Vehicle Entry Headway	Car Following Sensitivity	Pitt Car Following Constant
default	Constant Headway		
normal	Normal Distribution		
erlang1	Erlang Distribution Shape Parameter alpha=1		
erlang2	Erlang Distribution Shape Parameter alpha=2		
erlang3	Erlang Distribution Shape Parameter alpha=3		
erlang4	Erlang Distribution Shape Parameter alpha=4		
erlang5	Erlang Distribution Shape Parameter alpha=5		
erlang6	Erlang Distribution Shape Parameter alpha=6		
erlang7	Erlang Distribution Shape Parameter alpha=7		
erlang8	Erlang Distribution Shape Parameter alpha=8		
erlang9	Erlang Distribution Shape Parameter alpha=9		
CFS-1%+1%		-1% (1 to 5) +1% (6 to 10)	
CFS-2%+2%		-2% (1 to 5) +2% (6 to 10)	
CFS-3%+3%		-3% (1 to 5) +3% (6 to 10)	
CFS-4%+4%		-4% (1 to 5) +4% (6 to 10)	
CFS-5%+5%		-5% (1 to 5) +5% (6 to 10)	
CFS-6%+6%		-6% (1 to 5) +6% (6 to 10)	
CFS-7%+7%		-7% (1 to 5) +7% (6 to 10)	
CFS+10%		10%	
CFS+20%		20%	
CFS+30%		30%	
CFS+40%		40%	
CFS+50%		50%	
CFS+60%		60%	
CFS-10%		-10%	
CFS-20%		-20%	
CFS-30%		-30%	
CFS-40%		-40%	
CFS-50%		-50%	
CFS-60%		-60%	
CFS-70%		-70%	
CFS-80%		-80%	
CFS-90%		-90%	
PCFC-10%			9 ft
PCFC-20%			8 ft
PCFC-30%			7 ft
PCFC-40%			6 ft
PCFC-50%			5 ft
PCFC-60%			4 ft
PCFC-70%			3 ft
CFS+10%_PCFC-10%_normal	Normal Distribution	10%	9 ft
CFS+10%_PCFC-30%_normal	Normal Distribution	10%	7 ft
CFS+10%_PCFC-50%_normal	Normal Distribution	10%	5 ft
CFS+30%_PCFC-10%_normal	Normal Distribution	30%	9 ft
CFS+30%_PCFC-30%_normal	Normal Distribution	30%	7 ft
CFS+30%_PCFC-50%_normal	Normal Distribution	30%	5 ft
CFS+50%_PCFC-10%_normal	Normal Distribution	50%	9 ft
CFS+50%_PCFC-30%_normal	Normal Distribution	50%	7 ft
CFS+50%_PCFC-50%_normal	Normal Distribution	50%	5 ft
CFS-10%_PCFC-10%_normal	Normal Distribution	-10%	9 ft
CFS-10%_PCFC-30%_normal	Normal Distribution	-10%	7 ft
CFS-10%_PCFC-50%_normal	Normal Distribution	-10%	5 ft
CFS-30%_PCFC-10%_normal	Normal Distribution	-30%	9 ft
CFS-30%_PCFC-30%_normal	Normal Distribution	-30%	7 ft
CFS-30%_PCFC-50%_normal	Normal Distribution	-30%	5 ft
CFS-50%_PCFC-10%_normal	Normal Distribution	-50%	9 ft
CFS-50%_PCFC-30%_normal	Normal Distribution	-50%	7 ft
CFS-50%_PCFC-50%_normal	Normal Distribution	-50%	5 ft

selected global parameters

CENTENNIAL PROJECT - CALIBRATION PROCESS
EXISTING AM AND PM PEAK HOUR CONDITIONS

NETWORK PROPERTIES

Vehicle Entry Headway

Distribution Type

Default	Constant Headway
	Normal Distribution
	Erlang Distribution with Shape Parameter alpha=1
	Erlang Distribution with Shape Parameter alpha=2
	Erlang Distribution with Shape Parameter alpha=3
	Erlang Distribution with Shape Parameter alpha=4
	Erlang Distribution with Shape Parameter alpha=5
	Erlang Distribution with Shape Parameter alpha=6
	Erlang Distribution with Shape Parameter alpha=7
	Erlang Distribution with Shape Parameter alpha=8
	Erlang Distribution with Shape Parameter alpha=9

FRESIM SETUP

Driver Behavior

Car Following Sensitivity (CFS)

Driver Type	1	2	3	4	5	6	7	8	9	10
Default	1.25	1.15	1.05	0.95	0.85	0.75	0.65	0.55	0.45	0.35
-1% / +1%	1.24	1.14	1.04	0.94	0.84	0.76	0.66	0.56	0.45	0.35
-2% / +2%	1.23	1.13	1.03	0.93	0.83	0.77	0.66	0.56	0.46	0.36
-3% / +3%	1.21	1.12	1.02	0.92	0.82	0.77	0.67	0.57	0.46	0.36
-4% / +4%	1.20	1.10	1.01	0.91	0.82	0.78	0.68	0.57	0.47	0.36
-5% / +5%	1.19	1.09	1.00	0.90	0.81	0.79	0.68	0.58	0.47	0.37
-6% / +6%	1.18	1.08	0.99	0.89	0.80	0.80	0.69	0.58	0.48	0.37
-7% / +7%	1.16	1.07	0.98	0.88	0.79	0.80	0.70	0.59	0.48	0.37

Car Following Sensitivity (CFS)

Driver Type	1	2	3	4	5	6	7	8	9	10
Default	1.25	1.15	1.05	0.95	0.85	0.75	0.65	0.55	0.45	0.35
+10%	1.38	1.27	1.16	1.05	0.94	0.83	0.72	0.61	0.50	0.39
+20%	1.50	1.38	1.26	1.14	1.02	0.90	0.78	0.66	0.54	0.42
+30%	1.63	1.50	1.37	1.24	1.11	0.98	0.85	0.72	0.59	0.46
+40%	1.75	1.61	1.47	1.33	1.19	1.05	0.91	0.77	0.63	0.49
+50%	1.88	1.73	1.58	1.43	1.28	1.13	0.98	0.83	0.68	0.53
+60%	2.00	1.84	1.68	1.52	1.36	1.20	1.04	0.88	0.72	0.56
-10%	1.13	1.04	0.95	0.86	0.77	0.68	0.59	0.50	0.41	0.32
-20%	1.00	0.92	0.84	0.76	0.68	0.60	0.52	0.44	0.36	0.28
-30%	0.88	0.81	0.74	0.67	0.60	0.53	0.46	0.39	0.32	0.25
-40%	0.75	0.69	0.63	0.57	0.51	0.45	0.39	0.33	0.27	0.21
-50%	0.63	0.58	0.53	0.48	0.43	0.38	0.33	0.28	0.23	0.18
-60%	0.50	0.46	0.42	0.38	0.34	0.30	0.26	0.22	0.18	0.14
-70%	0.38	0.35	0.32	0.29	0.26	0.23	0.20	0.17	0.14	0.11
-80%	0.25	0.23	0.21	0.19	0.17	0.15	0.13	0.11	0.09	0.07
-90%	0.13	0.12	0.11	0.10	0.09	0.08	0.07	0.06	0.05	0.04

CENTENNIAL PROJECT - CALIBRATION PROCESS
EXISTING AM AND PM PEAK HOUR CONDITIONS

Pitt Car Following Constant (PCFC)

Default	10	feet
-10%	9	feet
-20%	8	feet
-30%	7	feet
-40%	6	feet
-50%	5	feet
-60%	4	feet
-70%	3	feet

COMBINATIONS

Car Following Sensitivity (CFS) of +10%; Vehicle Entry Headway with constant distribution

Pitt Car Following Constant (PCFC)

-10%	9	feet
-30%	7	feet
-50%	5	feet

Car Following Sensitivity (CFS) of +30%; Vehicle Entry Headway with constant distribution

Pitt Car Following Constant (PCFC)

-10%	9	feet
-30%	7	feet
-50%	5	feet

Car Following Sensitivity (CFS) of +50%; Vehicle Entry Headway with constant distribution

Pitt Car Following Constant (PCFC)

-10%	9	feet
-30%	7	feet
-50%	5	feet

Car Following Sensitivity (CFS) of -10%; Vehicle Entry Headway with constant distribution

Pitt Car Following Constant (PCFC)

-10%	9	feet
-30%	7	feet
-50%	5	feet

Car Following Sensitivity (CFS) of -30%; Vehicle Entry Headway with constant distribution

Pitt Car Following Constant (PCFC)

-10%	9	feet
-30%	7	feet
-50%	5	feet

Car Following Sensitivity (CFS) of -50%; Vehicle Entry Headway with constant distribution

Pitt Car Following Constant (PCFC)

-10%	9	feet
-30%	7	feet
-50%	5	feet

CENTENNIAL EXISTING CONDITIONS: Calibration Results Comparision - SPEED (MPH)
CORSIM ANALYSIS RESULTS - AM PEAK

[illegible]

CORSIM ANALYSIS RESULTS - AM PEAK

Freeway Segment	CFS	CFS	PCFC	PCFC	PCFC	PCFC	PCFC	PCFC	PCFC	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	
	-80%	-90%	-10%	-20%	-30%	-40%	-50%	-60%	-70%	+10%	+10%	+10%	+30%	-10%	-10%	-10%	-10%	-30%	-30%	-30%	-30%	-50%	
	PCFC	PCFC	PCFC	PCFC	PCFC	PCFC	PCFC	PCFC	PCFC	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	
SR-99 NB Mainline																							
SR-99 NB south end of the network to White Ln Off Ramp	63	64	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	64	64	
White Ln Off Ramp to White Ln Loop On Ramp	62	62	61	62	62	62	62	62	62	62	61	62	62	62	61	62	62	62	62	62	62	62	
White Ln Loop On Ramp to White Ln Direct On Ramp	43	44	39	41	42	41	40	41	41	38	40	39	39	42	41	43	42	40	42	42	43	43	
White Ln Direct On Ramp to Ming Ave Off Ramp	60	60	58	58	58	58	58	58	58	57	58	58	36	59	59	59	59	59	60	60	60	60	
Ming Ave Off Ramp to Ming Ave On Ramp	60	59	43	42	45	39	52	49	49	41	43	42	18	50	51	54	54	58	57	58	59	59	
Ming Ave On Ramp to SR58 EB/Wible Rd Off Ramp	39	38	30	30	31	30	31	31	32	30	31	30	30	31	31	34	33	35	34	36	39	38	
SR58 EB/Wible Rd Off Ramp to Wible Rd On Ramp	62	62	61	61	61	61	61	61	61	61	61	61	60	61	61	61	61	61	62	62	62	62	
Wible Rd On Ramp to SR58 WB On Ramp	60	60	59	60	60	60	59	60	60	59	60	60	59	60	60	60	60	60	60	60	59	60	
SR58 WB On Ramp to California Ave Off Ramp	59	59	56	57	57	57	57	56	57	56	55	56	55	57	58	58	57	58	58	59	59	59	
California Ave Off Ramp to California Ave Loop On Ramp	62	62	62	62	62	62	62	62	62	62	62	62	46	62	62	62	62	62	62	62	62	62	
California Ave Loop On Ramp to California Ave Direct On Ramp	58	58	57	54	56	58	57	57	57	48	55	58	23	57	57	58	57	57	59	58	59	58	
California Ave Direct On Ramp to Rosedale Hwy Off Ramp	56	57	43	42	45	49	48	47	46	38	41	49	33	47	49	52	48	52	56	54	56	55	
Rosedale Hwy Off Ramp to Buck Owens Blvd/Sillect Ave Off Ramp	62	62	59	59	60	60	60	59	60	59	59	60	59	60	60	61	60	61	62	61	61	61	
Buck Owens Blvd/Sillect Ave Off Ramp to Buck Owens Blvd/Sillect Ave On Ramp	63	63	63	62	63	63	63	63	63	62	62	63	62	63	63	63	63	63	63	63	63	63	
Buck Owens Blvd/Sillect Ave On Ramp to Airport Dr Off Ramp	61	61	60	60	60	60	60	60	60	59	60	60	59	60	60	61	61	61	61	61	61	61	
Airport Dr Off Ramp to SR99 NB north end of the network	63	64	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	
SR-99 SB Mainline																							
SR99 SB north end of the network to Airport Dr On Ramp	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	
Airport Dr On Ramp to Rosedale Hwy Off Ramp	60	60	58	58	58	58	58	59	58	58	57	58	56	58	59	58	58	58	59	60	59	59	
Rosedale Hwy Off Ramp to Rosedale Hwy Loop On Ramp	63	63	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	63	62	63	63	63	
Rosedale Hwy Loop On Ramp to Rosedale Hwy Direct On Ramp	61	61	59	58	59	59	60	59	59	59	59	60	58	59	59	60	60	59	60	60	60	60	
Rosedale Hwy Direct On Ramp to California Ave Off Ramp	59	58	53	52	52	53	53	54	54	51	51	51	47	53	54	55	55	57	57	57	58	58	
California Ave Off Ramp to California Ave On Ramp	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	
California Ave On Ramp to SR58 EB/Stockdale Hwy Off Ramp	59	60	58	58	58	58	59	58	58	57	57	58	56	58	58	59	59	59	59	60	59	59	
SR58 EB/Stockdale Hwy Off Ramp to SR58 WB On Ramp	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	
SR58 WB On Ramp to Real Rd On Ramp	51	53	54	50	54	52	52	53	53	52	52	51	52	53	52	51	54	52	51	53	53	53	
Real Rd On Ramp to Ming Ave Off Ramp	59	60	59	57	59	58	58	58	58	58	58	58	57	58	58	58	59	59	57	59	60	59	
Ming Ave Off Ramp to Ming Ave On Ramp	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	
Ming Ave On Ramp to White Ln Off Ramp	62	62	61	61	61	61	61	61	61	61	61	61	61	61	61	61	62	62	62	62	62	62	
White Ln Off Ramp to White Ln Loop On Ramp	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	
White Ln Loop On Ramp to White Ln Direct On Ramp	63	62	62	63	63	62	62	63	62	62	62	63	63	62	63	63	62	63	63	63	63	63	
White Ln Direct On Ramp to SR99 SB south end of the network	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	
SR58 EB Mainline																							
SR58 west end of the network to SR99 On Ramp	57	56	54	54	54	55	55	55	55	54	54	54	52	55	55	55	55	56	56	56	56	56	
SR99 On Ramp to H St Off Ramp	59	58	58	57	58	58	58	58	58	58	58	58	57	58	58	58	58	58	58	59	58	58	
H St Off Ramp to Chester Ave On Ramp	60	61	58	60	59	59	59	59	59	59	58	59	57	60	59	60	60	60	60	61	60	61	
Chester Ave On Ramp to Union Ave Off Ramp	58	58	55	56	55	55	56	54	55	54	53	55	50	56	55	56	57	57	57	58	57	58	
Union Ave Off Ramp to Union Ave Loop On Ramp	62	61	61	61	61	61	61	61	61	61	61	61	60	61	61	61	61	62	61	61	61	61	
Union Ave Loop On Ramp to Union Ave Direct On Ramp	60	59	59	59	59	59	58	58	59	58	59	59	60	59	59	59	59	60	59	60	60	60	
Union Ave Direct On Ramp to SR58 east end of the network	61	61	60	60	60	60	60	60	60	60	60	60	60	60	60	60	61	61	60	61	61	61	
SR58 WB Mainline																							
SR58 east end of the network to Brundage Ln Off Ramp	63	63	62	62	62	62	62	62	62	62	62	62	61	62	62	62	62	62	62	63	63	63	
Brundage Ln Off Ramp to Brundage Ln On Ramp	62	62	62	61	62	61	62	62	61	61	61	61	61	61	62	62	62	62	62	62	62	62	
Brundage Ln On Ramp to Union Ave On Ramp	61	61	59	60	59	59	60	59	60	59	59	60	59	60	60	60	60	60	60	61	60	60	
Union Ave On Ramp to Chester Ave Off Ramp	60	60	58	59	59	58	59	59	59	57	57	59	57	58	59	57	59	59	59	59	59	60	
Chester Ave Off Ramp to H St On Ramp	62	62	61	61	61	61	61	61	61	61	61	61	61	61	62	61	61	61	62	62	62	62	
H St On Ramp to SR99 NB Off Ramp	59	59	58	57	58	57	58	58	57	56	56	58	55	58	58	58	58	58	59	59	59	59	
SR99 NB Off Ramp to SR99 SB Off Ramp	58	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	58	57	

CENTENNIAL EXISTING CONDITIONS: Calibration Results Comparision - Density (Vehicle/Lane/Mile)
CORSIM ANALYSIS RESULTS - AM PEAK

Freeway Segment	F&P Analysis	Default (Constant Headway)	Normal	Erlang1	Erlang2	Erlang3	Erlang4	Erlang5	Erlang6	Erlang7	Erlang8	Erlang9	CFS -1%+1%	CFS -2%+2%	CFS -3%+3%	CFS -4%+4%	CFS -5%+5%	CFS -6%+6%	CFS -7%+7%	CFS +10%	CFS +20%	CFS +30%	CFS +40%	CFS +50%	CFS +60%	CFS -10%	CFS -20%	CFS -30%	CFS -40%	CFS -50%	CFS -60%	CFS -70%
SR-99 NB Mainline																																
SR-99 NB south end of the network to White Ln Off Ramp	22	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	23	19	19	19	19	19	19	19
White Ln Off Ramp to White Ln Loop On Ramp	21	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	20	22	34	53	18	18	18	18	18	18	18
White Ln Loop On Ramp to White Ln Direct On Ramp	-	37	35	37	35	35	37	36	34	35	35	35	35	37	37	36	33	35	36	37	36	49	64	83	85	36	34	33	33	33	32	32
White Ln Direct On Ramp to Ming Ave Off Ramp	35	30	30	30	30	31	30	30	30	30	30	30	30	30	30	30	30	30	30	35	34	61	73	81	81	30	29	29	29	29	29	29
Ming Ave Off Ramp to Ming Ave On Ramp	23	38	42	38	36	52	32	40	30	38	48	46	52	45	38	38	40	38	37	64	63	74	76	79	80	33	29	26	24	23	23	22
Ming Ave On Ramp to SR58 EB/Wible Rd Off Ramp	-	48	48	47	47	45	47	48	47	48	48	48	48	48	48	48	48	48	48	47	46	46	44	43	41	48	47	45	43	42	40	39
SR58 EB/Wible Rd Off Ramp to Wible Rd On Ramp	21	19	19	19	19	19	19	19	19	19	19	19	19	19	20	19	19	20	19	19	18	17	17	16	19	19	19	19	19	19	19	19
Wible Rd On Ramp to SR58 WB On Ramp	-	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	19	20	19	18	17	16	20	20	20	20	20	20	20
SR58 WB On Ramp to California Ave Off Ramp	29	27	27	27	27	26	27	27	27	26	26	26	27	27	28	27	27	27	27	27	28	27	26	25	24	27	27	27	26	26	26	26
California Ave Off Ramp to California Ave Loop On Ramp	23	21	22	21	20	21	21	21	21	21	20	21	21	21	21	21	21	22	21	21	41	38	20	21	18	21	21	21	21	21	21	21
California Ave Loop On Ramp to California Ave Direct On Ramp	-	23	29	23	22	22	22	23	23	22	24	24	25	23	31	23	24	29	23	24	65	68	37	33	31	22	23	22	22	22	22	23
California Ave Direct On Ramp to Rosedale Hwy Off Ramp	27	33	33	33	30	30	30	32	34	30	31	34	37	33	38	32	34	34	35	44	43	38	37	33	31	28	26	26	25	25	25	25
Rosedale Hwy Off Ramp to Buck Owens Blvd/Sillect Ave Off Ramp	-	17	18	17	17	17	17	17	17	17	17	17	17	17	18	17	17	17	18	17	17	17	16	16	15	17	17	17	17	17	17	16
Buck Owens Blvd/Sillect Ave Off Ramp to Buck Owens Blvd/Sillect Ave On Ramp	17	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	12	12	13	13	13	13	13	13	13
Buck Owens Blvd/Sillect Ave On Ramp to Airport Dr Off Ramp	-	14	15	14	14	15	14	15	15	15	14	14	15	14	15	15	15	15	15	15	14	14	14	13	14	14	14	14	15	15	15	14
Airport Dr Off Ramp to SR99 NB north end of the network	14	10	10	10	9	10	10	10	10	10	10	10	10	9	10	10	10	10	10	10	9	9	9	9	9	10	10	10	10	10	10	10
SR-99 SB Mainline																																
SR99 SB north end of the network to Airport Dr On Ramp	20	16	16	16	16	15	16	16	16	15	16	16	16	16	15	16	16	16	16	16	16	16	16	16	16	16	16	15	15	15	15	15
Airport Dr On Ramp to Rosedale Hwy Off Ramp	19	18	18	18	18	18	17	17	17	18	18	18	17	17	18	18	17	18	18	18	18	18	19	19	17	17	17	17	17	17	17	17
Rosedale Hwy Off Ramp to Rosedale Hwy Loop On Ramp	17	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Rosedale Hwy Loop On Ramp to Rosedale Hwy Direct On Ramp	-	16	16	16	16	16	16	16	17	16	16	16	16	16	16	16	16	16	16	17	16	17	17	18	19	16	16	16	16	16	16	16
Rosedale Hwy Direct On Ramp to California Ave Off Ramp	23	24	24	24	24	24	24	25	24	24	24	26	23	24	25	24	24	24	24	25	26	26	29	31	30	24	23	22	23	22	22	21
California Ave Off Ramp to California Ave On Ramp	19	16	16	16	16	16	17	16	16	16	16	16	16	16	17	16	16	16	17	17	16	16	16	16	16	17	16	16	16	16	16	16
California Ave On Ramp to SR58 EB/Stockdale Hwy Off Ramp	20	18	18	18	19	18	19	18	18	18	18	18	18	19	19	18	19	18	19	19	19	20	19	20	21	18	18	18	18	18	18	18
SR58 EB/Stockdale Hwy Off Ramp to SR58 WB On Ramp	13	11	11	11	11	11	11	11	11	11	12	11	11	11	11	11	11	12	12	11	11	11	11	11	12	11	11	11	11	11	11	12
SR58 WB On Ramp to Real Rd On Ramp	-	16	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	14	15	15	15	16	15	15	15	15
Real Rd On Ramp to Ming Ave Off Ramp	-	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	17	16	16	16	16	16	16
Ming Ave Off Ramp to Ming Ave On Ramp	15	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	13	13	13	13	13	13	13	13
Ming Ave On Ramp to White Ln Off Ramp	21	17	17	17	17	17	17	16	17	17	17	17	17	16	16	16	16	16	16	17	17	16	17	17	17	17	17	17	16	16	16	16
White Ln Off Ramp to White Ln Loop On Ramp	14	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	12	11	11	11	11	12	11	11	11	11	11	11
White Ln Loop On Ramp to White Ln Direct On Ramp	-	11	11	11	10	11	11	10	11	11	11	11	11	11	11	11	11	11	10	11	11	10	11	11	11	11	11	11	10	10	11	11
White Ln Direct On Ramp to SR99 SB south end of the network	15	12	12	12	11	12	12	11	12	12	12	12	12	12	12	12	12	12	11	12	12	12	12	12	12	12	12	12	12	11	12	12
SR58 EB Mainline																																
SR58 west end of the network to SR99 On Ramp	-	9	9	9	9	9	9	9	9	9	9	9	10	9	9	9	9	10	9	10	10	10	10	10	10	9	9	9	9	9	9	9
SR99 On Ramp to H St Off Ramp	-	22	21	21	22	21	22	22	22	21	22	22	22	22	21	22	21	22	21	22	21	22	21	21	21	22	22	22	21	21	21	21
H St Off Ramp to Chester Ave On Ramp	29	24	24	23	24	23	24	23	24	23	24	24	24	24	23	24	23	24	23	24	24	23	23	25	23	24	24	23	24	23	23	23
Chester Ave On Ramp to Union Ave Off Ramp	34	34	33	33	35	33	34	33	34	33	34	34	34	34	34	33	33	34	33	34	34	36	34	42	39	33	33	33	33	32	32	31
Union Ave Off Ramp to Union Ave Loop On Ramp	25	25	25	24	25	25	25	25	25	25	25	25	24	25	24	25	24	25	25	25	24	24	24	24	24	24	24	25	25	24	25	24
Union Ave Loop On Ramp to Union Ave Direct On Ramp	-	23	22	22	23	23	23	23	22	22	23	23	22	22	22	23	22	23	22	23	22	22	22	22	22	22	22	22	23	22	23	22
Union Ave Direct On Ramp to SR58 east end of the network	28	28	27	26	27	27	28	28	27	27	28	27	27	27	27	27	27	27	27	28	27	27	26	27	26	27	27	28	27	27	27	26
SR58 WB Mainline																																
SR58 east end of the network to Brundage Ln Off Ramp	30	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	25	25	25	25	25
Brundage Ln Off Ramp to Brundage Ln On Ramp	25	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21	21	22
Brundage Ln On Ramp to Union Ave On Ramp	-	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	22	21	22	21	21	21	21	21	21	21
Union Ave On Ramp to Chester Ave Off Ramp	-	25	25	25	24	25	24	25	25	24	24	25</																				

Freeway Segment	CFS	CFS	PCFC	PCFC	PCFC	PCFC	PCFC	PCFC	PCFC	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS
	-80%	-90%	-10%	-20%	-30%	-40%	-50%	-60%	-70%	+10%	+10%	+10%	+30%	-10%	-10%	-10%	-30%	-30%	-30%	-50%	-50%	-50%
	PCFC	PCFC	PCFC	PCFC	PCFC	PCFC	PCFC	PCFC	PCFC	-10%	-30%	-80%	-10%	-10%	-30%	-50%	-10%	-30%	-50%	-30%	-50%	-60%
	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
SR-99 NB Mainline																						
SR-99 NB south end of the network to White Ln Off Ramp	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
White Ln Off Ramp to White Ln Loop On Ramp	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
White Ln Loop On Ramp to White Ln Direct On Ramp	32	32	36	34	34	34	35	34	35	37	35	36	36	33	34	33	33	35	33	33	32	33
White Ln Direct On Ramp to Ming Ave Off Ramp	29	29	30	30	30	30	30	30	30	30	30	30	49	30	29	29	29	29	29	29	29	29
Ming Ave Off Ramp to Ming Ave On Ramp	22	22	34	34	33	37	27	29	29	36	34	35	70	28	27	25	25	23	23	23	23	23
Ming Ave On Ramp to SR58 EB/Wible Rd Off Ramp	38	38	48	48	48	48	47	48	46	48	48	49	47	47	46	43	44	41	42	40	38	39
SR58 EB/Wible Rd Off Ramp to Wible Rd On Ramp	19	19	20	19	19	19	20	19	20	19	20	19	19	19	19	19	19	19	19	19	19	19
Wible Rd On Ramp to SR58 WB On Ramp	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
SR58 WB On Ramp to California Ave Off Ramp	26	25	28	27	27	27	27	27	27	28	28	27	28	26	26	26	27	26	26	26	26	26
California Ave Off Ramp to California Ave Loop On Ramp	21	21	21	21	21	20	21	21	21	21	21	21	28	21	20	21	21	21	21	21	21	21
California Ave Loop On Ramp to California Ave Direct On Ramp	22	22	23	24	23	22	22	23	23	27	24	22	53	23	22	22	23	23	22	22	22	22
California Ave Direct On Ramp to Rosedale Hwy Off Ramp	25	24	33	33	31	28	29	30	30	37	34	29	42	29	28	27	29	27	24	26	25	25
Rosedale Hwy Off Ramp to Buck Owens Blvd/Sillect Ave Off Ramp	17	16	18	18	17	16	17	17	17	18	18	17	17	17	17	17	17	17	16	17	17	17
Buck Owens Blvd/Sillect Ave Off Ramp to Buck Owens Blvd/Sillect Ave On Ramp	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Buck Owens Blvd/Sillect Ave On Ramp to Airport Dr Off Ramp	15	14	15	15	15	14	15	15	15	15	15	15	15	14	14	15	14	14	14	14	14	15
Airport Dr Off Ramp to SR99 NB north end of the network	10	10	10	10	10	9	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
SR-99 SB Mainline																						
SR99 SB north end of the network to Airport Dr On Ramp	15	15	16	16	16	16	15	15	16	16	16	16	16	16	16	15	15	15	16	15	15	15
Airport Dr On Ramp to Rosedale Hwy Off Ramp	17	17	17	18	17	17	17	17	17	17	18	17	18	17	17	17	17	17	17	17	17	17
Rosedale Hwy Off Ramp to Rosedale Hwy Loop On Ramp	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Rosedale Hwy Loop On Ramp to Rosedale Hwy Direct On Ramp	16	16	16	17	16	16	16	16	16	16	16	16	17	17	16	16	16	16	16	16	16	16
Rosedale Hwy Direct On Ramp to California Ave Off Ramp	21	21	23	24	24	24	24	23	23	25	24	24	26	24	23	23	23	22	22	22	21	22
California Ave Off Ramp to California Ave On Ramp	17	16	16	17	16	16	16	16	17	16	16	16	16	16	16	16	16	16	16	16	16	16
California Ave On Ramp to SR58 EB/Stockdale Hwy Off Ramp	18	18	18	19	18	18	18	18	18	18	19	18	19	18	18	18	18	18	18	18	18	18
SR58 EB/Stockdale Hwy Off Ramp to SR58 WB On Ramp	11	11	11	12	11	11	11	12	12	11	11	11	11	11	11	12	11	12	11	12	11	11
SR58 WB On Ramp to Real Rd On Ramp	16	15	14	16	15	15	15	15	15	15	15	15	16	15	15	16	15	15	15	15	15	15
Real Rd On Ramp to Ming Ave Off Ramp	16	16	15	17	16	16	16	16	17	16	16	16	16	16	16	16	16	16	16	16	16	16
Ming Ave Off Ramp to Ming Ave On Ramp	13	13	12	13	13	13	13	13	13	13	13	13	12	13	13	13	13	13	13	13	13	13
Ming Ave On Ramp to White Ln Off Ramp	16	16	16	17	16	17	16	16	17	17	17	17	16	17	17	17	16	17	16	16	16	16
White Ln Off Ramp to White Ln Loop On Ramp	11	11	11	11	11	11	11	11	12	11	11	11	11	11	11	11	11	11	11	11	11	11
White Ln Loop On Ramp to White Ln Direct On Ramp	11	11	11	11	11	11	11	11	11	11	11	11	10	11	11	11	11	11	11	11	11	11
White Ln Direct On Ramp to SR99 SB south end of the network	12	12	12	12	12	12	12	12	12	12	12	12	11	12	12	12	12	12	12	12	12	12
SR58 EB Mainline																						
SR58 west end of the network to SR99 On Ramp	9	9	9	9	9	9	9	9	9	9	9	9	10	9	9	9	9	9	9	9	9	9
SR99 On Ramp to H St Off Ramp	22	22	22	21	22	22	22	22	21	21	21	22	21	21	22	22	22	21	22	21	22	21
H St Off Ramp to Chester Ave On Ramp	23	23	24	23	24	24	24	25	23	23	24	23	24	23	24	23	24	23	24	23	24	23
Chester Ave On Ramp to Union Ave Off Ramp	32	32	33	32	33	33	33	35	33	33	34	33	36	32	33	33	32	31	33	31	32	31
Union Ave Off Ramp to Union Ave Loop On Ramp	25	25	25	24	25	25	25	26	25	25	25	24	24	24	25	25	24	25	24	25	24	24
Union Ave Loop On Ramp to Union Ave Direct On Ramp	22	23	23	22	22	22	23	23	22	23	22	22	22	22	22	22	22	22	23	22	22	22
Union Ave Direct On Ramp to SR58 east end of the network	27	27	27	27	27	27	27	28	27	27	27	27	27	27	27	27	27	27	27	27	27	27
SR58 WB Mainline																						
SR58 east end of the network to Brundage Ln Off Ramp	25	25	26	26	26	26	26	26	26	26	26	26	26	26	26	26	25	26	26	25	25	25
Brundage Ln Off Ramp to Brundage Ln On Ramp	22	22	22	22	22	22	21	22	22	22	22	22	22	22	22	22	22	22	22	22	22	21
Brundage Ln On Ramp to Union Ave On Ramp	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
Union Ave On Ramp to Chester Ave Off Ramp	24	24	25	25	24	24	24	25	24	25	25	25	26	25	24	25	24	24	24	24	25	24
Chester Ave Off Ramp to H St On Ramp	21	21	21	22	21	21	21	21	21	22	21	22	22	21	21	22	21	21	21	21	21	21
H St On Ramp to SR99 NB Off Ramp	24	24	24	25	24	24	24	24	25	25	25	25	25	24	24	24	24	24	24	24	24	24
SR99 NB Off Ramp to SR99 SB Off Ramp	17	17	17	17	16	17	16	16	16	17	16	17	16	17	17	17	16	17	16	17	16	16

CENTENNIAL EXISTING CONDITIONS: Calibration Results Comparision - Level of Service (LOS) HCM 2000 Criteria
CORSIM ANALYSIS RESULTS - AM PEAK

Freeway Segment	F&P Analysis	Default (Constant Headway)	Normal	Erlang1	Erlang2	Erlang3	Erlang4	Erlang5	Erlang6	Erlang7	Erlang8	Erlang9	CFS -1%+1%	CFS -2%+2%	CFS -3%+3%	CFS -4%+4%	CFS -5%+5%	CFS -6%+6%	CFS -7%+7%	CFS +10%	CFS +20%	CFS +30%	CFS +40%	CFS +50%	CFS +60%	CFS -10%	CFS -20%	CFS -30%	CFS -40%	CFS -50%	CFS -60%	CFS -70%	CFS -80%	CFS -90%			
SR-99 NB Mainline																																					
SR-99 NB south end of the network to White Ln Off Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
White Ln Off Ramp to White Ln Loop On Ramp	C	C	C	C	C	C	C	B	B	B	C	B	C	C	C	B	B	C	C	C	C	D	F	C	C	C	C	B	C	B	B	B	B	B			
White Ln Loop On Ramp to White Ln Direct On Ramp	-	E	E	E	E	D	E	E	D	E	D	D	E	E	E	E	D	E	E	E	F	F	F	F	F	E	D	D	D	D	D	D	D	D			
White Ln Direct On Ramp to Ming Ave Off Ramp	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	F	F	F	F	F	F	D	D	D	D	D	D	D	D			
Ming Ave Off Ramp to Ming Ave On Ramp	C	E	E	E	E	F	D	E	D	E	F	F	F	E	E	E	E	E	E	F	F	F	F	F	F	D	D	C	C	C	C	C	C	C			
Ming Ave On Ramp to SR58 EB/Wible Rd Off Ramp	-	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E	E	F	F	F	E	E	E	E	E	E			
SR58 EB/Wible Rd Off Ramp to Wible Rd On Ramp	-	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	B	C	C	C	C	C	C	C	C	C			
Wible Rd On Ramp to SR58 WB On Ramp	-	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	B	C	C	C	C	C	C	C	C	C			
SR58 WB On Ramp to California Ave Off Ramp	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D			
California Ave Off Ramp to California Ave Loop On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C	C			
California Ave Loop On Ramp to California Ave Direct On Ramp	-	C	D	C	C	C	C	C	C	C	C	C	C	D	C	C	C	C	C	F	F	E	D	C	C	C	C	C	C	C	C	C	C	C			
California Ave Direct On Ramp to Rosedale Hwy Off Ramp	D	D	D	D	D	D	D	D	D	D	D	D	E	D	E	D	D	D	D	E	E	E	E	E	D	D	D	D	C	C	C	C	C	C			
Rosedale Hwy Off Ramp to Buck Owens Blvd/Sillect Ave Off Ramp	-	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
Buck Owens Blvd/Sillect Ave Off Ramp to Buck Owens Blvd/Sillect Ave On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
Buck Owens Blvd/Sillect Ave On Ramp to Airport Dr Off Ramp	-	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
Airport Dr Off Ramp to SR99 NB north end of the network	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
SR-99 SB Mainline																																					
SR99 SB north end of the network to Airport Dr On Ramp	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
Airport Dr On Ramp to Rosedale Hwy Off Ramp	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	C	B	B	B	B	B	B	B	B	B	B			
Rosedale Hwy Off Ramp to Rosedale Hwy Loop On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
Rosedale Hwy Loop On Ramp to Rosedale Hwy Direct On Ramp	-	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B			
Rosedale Hwy Direct On Ramp to California Ave Off Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D	D	D	D	C	C	C	C	C	C	C	C	C	C				
California Ave Off Ramp to California Ave On Ramp	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
California Ave On Ramp to SR58 EB/Stockdale Hwy Off Ramp	C	C	C	C	C	C	C	C	B	C	C	C	C	C	B	C	C	C	C	C	C	C	C	C	C	B	C	B	B	B	B	B	B	B			
SR58 EB/Stockdale Hwy Off Ramp to SR58 WB On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
SR58 WB On Ramp to Real Rd On Ramp	-	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
Real Rd On Ramp to Ming Ave Off Ramp	-	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
Ming Ave Off Ramp to Ming Ave On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
Ming Ave On Ramp to White Ln Off Ramp	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
White Ln Off Ramp to White Ln Loop On Ramp	B	B	B	B	A	B	B	A	B	B	B	B	B	A	A	B	A	B	A	B	B	A	B	B	B	B	B	A	A	B	B	B	B	B			
White Ln Loop On Ramp to White Ln Direct On Ramp	-	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B	A	A	A	B	A	A	A	A	A	A	A	A	A	A			
White Ln Direct On Ramp to SR99 SB south end of the network	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			
SR58 EB Mainline																																					
SR58 west end of the network to SR99 On Ramp	-	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A			
SR99 On Ramp to H St Off Ramp	-	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
H St Off Ramp to Chester Ave On Ramp	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
Chester Ave On Ramp to Union Ave Off Ramp	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	E	D	E	E	D	D	D	D	D	D	D	D	D	D	D			
Union Ave Off Ramp to Union Ave Loop On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
Union Ave Loop On Ramp to Union Ave Direct On Ramp	-	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
Union Ave Direct On Ramp to SR58 east end of the network	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D			
SR58 WB Mainline																																					
SR58 east end of the network to Brundage Ln Off Ramp	D	C	C	C	C	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D	D	C	C	C	C	C	C	C	C	C	C	C			
Brundage Ln Off Ramp to Brundage Ln On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
Brundage Ln On Ramp to Union Ave On Ramp	-	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
Union Ave On Ramp to Chester Ave Off Ramp	-	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
Chester Ave Off Ramp to H St On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C			
H St On Ramp to SR99 NB Off Ramp	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D	D	C	C	C	C	C	C	C	C	C	C	C			
SR99 NB Off Ramp to SR99 SB Off Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B			

Freeway Segment	PCFC -10%	PCFC -20%	PCFC -30%	PCFC -40%	PCFC -50%	PCFC -60%	PCFC -70%	CFS +10% PCFC -10%	CFS +10% PCFC -30%	CFS +10% PCFC -50%	CFS +30% PCFC -10%	CFS -10% PCFC -10%	CFS -10% PCFC -30%	CFS -10% PCFC -50%	CFS -30% PCFC -10%	CFS -30% PCFC -30%	CFS -30% PCFC -50%	CFS -50% PCFC -10%	CFS -50% PCFC -30%	CFS -50% PCFC -50%
SR-99 NB Mainline								Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
SR-99 NB south end of the network to White Ln Off Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
White Ln Off Ramp to White Ln Loop On Ramp	C	C	C	C	B	C	C	C	C	C	C	C	B	C	C	C	C	B	C	C
White Ln Loop On Ramp to White Ln Direct On Ramp	E	D	D	D	D	D	D	E	D	E	E	D	D	D	D	D	D	D	D	D
White Ln Direct On Ramp to Ming Ave Off Ramp	D	D	D	D	D	D	D	D	D	D	F	D	D	D	D	D	D	D	D	D
Ming Ave Off Ramp to Ming Ave On Ramp	D	D	D	E	D	D	D	E	D	D	F	D	D	C	C	C	C	C	C	C
Ming Ave On Ramp to SR58 EB/Wible Rd On Ramp	F	F	F	F	F	F	F	F	F	F	F	F	F	E	E	E	E	E	E	E
SR58 EB/Wible Rd Off Ramp to Wible Rd On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Wible Rd On Ramp to SR58 WB On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
SR58 WB On Ramp to California Ave Off Ramp	D	D	D	D	D	D	D	D	D	D	D	D	C	D	D	D	D	D	D	D
California Ave Off Ramp to California Ave Loop On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
California Ave Loop On Ramp to California Ave Direct On Ramp	C	C	C	C	C	C	C	C	C	C	F	C	C	C	C	C	C	C	C	C
California Ave Direct On Ramp to Rosedale Hwy Off Ramp	D	D	D	D	D	D	D	E	D	D	E	D	D	D	D	D	D	C	C	C
Rosedale Hwy Off Ramp to Buck Owens Blvd/Sillect Ave Off Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Buck Owens Blvd/Sillect Ave Off Ramp to Buck Owens Blvd/Sillect Ave On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Buck Owens Blvd/Sillect Ave On Ramp to Airport Dr Off Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Airport Dr Off Ramp to SR99 NB north end of the network	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
SR-99 SB Mainline																				
SR99 SB north end of the network to Airport Dr On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Airport Dr On Ramp to Rosedale Hwy Off Ramp	B	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B
Rosedale Hwy Off Ramp to Rosedale Hwy Loop On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Rosedale Hwy Loop On Ramp to Rosedale Hwy Direct On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Rosedale Hwy Direct On Ramp to California Ave Off Ramp	C	C	C	C	C	C	C	C	C	C	D	C	C	C	C	C	C	C	C	C
California Ave Off Ramp to California Ave On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
California Ave On Ramp to SR58 EB/Stockdale Hwy Off Ramp	B	C	C	C	B	C	C	C	C	C	C	C	C	B	B	B	B	C	C	C
SR58 EB/Stockdale Hwy Off Ramp to SR58 WB On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
SR58 WB On Ramp to Real Rd On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Real Rd On Ramp to Ming Ave Off Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Ming Ave Off Ramp to Ming Ave On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Ming Ave On Ramp to White Ln Off Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
White Ln Off Ramp to White Ln Loop On Ramp	A	B	B	B	B	A	B	B	B	B	A	B	B	B	B	A	B	A	A	B
White Ln Loop On Ramp to White Ln Direct On Ramp	A	A	A	A	A	A	B	A	A	A	A	A	A	A	A	A	A	A	A	A
White Ln Direct On Ramp to SR99 SB south end of the network	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
SR58 EB Mainline																				
SR58 west end of the network to SR99 On Ramp	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
SR99 On Ramp to H St Off Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
H St Off Ramp to Chester Ave On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Chester Ave On Ramp to Union Ave Off Ramp	D	D	D	D	D	D	D	D	D	D	E	D	D	D	D	D	D	D	D	D
Union Ave Off Ramp to Union Ave Loop On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Union Ave Loop On Ramp to Union Ave Direct On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Union Ave Direct On Ramp to SR58 east end of the network	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
SR58 WB Mainline																				
SR58 east end of the network to Brundage Ln Off Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Brundage Ln Off Ramp to Brundage Ln On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Brundage Ln On Ramp to Union Ave On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Union Ave On Ramp to Chester Ave Off Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Chester Ave Off Ramp to H St On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
H St On Ramp to SR99 NB Off Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
SR99 NB Off Ramp to SR99 SB Off Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B

CENTENNIAL EXISTING CONDITIONS: Calibration Results Comparision - Cumulative Travel Time (seconds)
CORSIM ANALYSIS RESULTS - AM PEAK

Freeway Segment	Free Flow	Default (Constant Headway)	Normal	Erlang1	Erlang2	Erlang3	Erlang4	Erlang5	Erlang6	Erlang7	Erlang8	Erlang9	CFS -1%+1%	CFS -2%+2%	CFS -3%+3%	CFS -4%+4%	CFS -5%+5%	CFS -6%+6%	CFS -7%+7%	CFS +10%	CFS +20%	CFS +30%	CFS +40%	CFS +50%	CFS +60%	CFS +10%	CFS +20%	CFS +30%	CFS +40%	CFS +50%	CFS +60%	CFS +70%	CFS +80%
SR-99 NB Mainline																																	
Ming Ave Off Ramp to Ming Ave On Ramp	167	207	212	210	204	225	199	210	196	206	219	216	222	216	207	207	207	207	205	251	246	348	413	475	528	199	192	188	184	183	182	180	181
Ming Ave On Ramp to SR58 EB/Wible Rd Off Ramp	177	228	233	231	225	245	219	231	217	227	240	237	243	237	228	228	227	228	226	272	267	369	434	497	550	220	212	207	203	201	199	197	197
SR58 EB/Wible Rd Off Ramp to Wible Rd On Ramp	207	260	266	263	257	278	251	263	249	259	272	270	276	269	260	261	259	260	258	304	300	402	467	530	582	253	245	239	235	233	231	229	229
Wible Rd On Ramp to SR58 WB On Ramp	216	270	275	273	267	287	261	273	259	269	282	279	285	279	270	270	269	270	268	314	309	412	476	539	592	262	254	249	244	243	241	238	239
SR58 WB On Ramp to California Ave Off Ramp	248	307	312	310	303	323	298	310	296	305	318	315	323	316	307	306	305	306	304	351	348	449	515	578	630	299	290	285	279	278	276	273	273
California Ave Off Ramp to California Ave Loop On Ramp	263	323	329	326	320	340	314	326	312	321	335	332	339	333	324	323	322	324	321	367	380	481	532	597	647	315	307	302	296	294	293	289	290
California Ave Loop On Ramp to California Ave Direct On Ramp	272	333	341	336	329	349	324	336	322	331	345	342	349	342	337	332	332	336	330	378	408	510	549	613	662	325	316	311	305	303	302	299	299
California Ave Direct On Ramp to Rosedale Hwy Off Ramp	293	366	374	369	359	379	354	367	356	361	376	376	385	374	375	364	364	370	363	413	452	555	590	654	700	356	344	337	330	328	326	324	324
Rosedale Hwy Off Ramp to Buck Owens Blvd/Sillect Ave Off Ramp	308	382	390	385	376	395	370	383	372	377	393	392	402	391	392	381	380	386	380	429	469	572	606	671	716	372	360	353	346	344	342	339	339
Buck Owens Blvd/Sillect Ave Off Ramp to Buck Owens Blvd/Sillect Ave On Ramp	340	416	424	418	409	428	403	417	406	410	426	425	435	424	425	414	413	419	413	463	502	606	640	704	750	405	393	386	379	377	375	372	372
Buck Owens Blvd/Sillect Ave On Ramp to Airport Dr Off Ramp	371	450	458	452	443	463	437	451	440	444	460	460	470	459	459	448	447	453	447	497	537	640	675	739	786	439	427	420	413	410	409	406	406
Airport Dr Off Ramp to SR99 NB north end of the network	410	490	498	492	483	503	478	491	480	485	500	500	510	499	499	488	487	494	487	537	577	681	716	780	826	479	467	460	453	450	449	446	446
% Difference against Free Flow	-	19%	21%	20%	18%	23%	16%	20%	17%	18%	22%	22%	24%	22%	22%	19%	19%	20%	19%	31%	41%	66%	74%	90%	101%	17%	14%	12%	10%	10%	9%	9%	9%
SR-99 SB Mainline																																	
SR99 SB north end of the network to Airport Dr On Ramp	47	48	48	49	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
Airport Dr On Ramp to Rosedale Hwy Off Ramp	77	82	82	82	82	82	81	82	82	82	82	82	81	81	81	82	82	82	82	82	82	83	84	83	81	81	81	81	81	81	80	80	80
Rosedale Hwy Off Ramp to Rosedale Hwy Loop On Ramp	100	107	107	107	107	106	106	106	107	107	107	107	106	106	106	106	106	106	107	107	107	107	108	109	108	106	106	105	105	105	104	105	105
Rosedale Hwy Loop On Ramp to Rosedale Hwy Direct On Ramp	113	121	121	121	121	120	120	120	121	121	121	121	120	120	120	120	120	120	121	121	121	122	122	124	124	120	120	119	119	119	118	118	118
Rosedale Hwy Direct On Ramp to California Ave Off Ramp	142	158	159	158	157	157	158	157	158	158	158	160	156	156	158	157	157	158	158	159	160	162	167	172	172	158	155	154	154	153	152	152	151
California Ave Off Ramp to California Ave On Ramp	155	171	172	172	171	171	171	171	171	172	172	171	173	169	170	171	171	170	171	173	173	176	181	186	186	171	168	167	167	166	166	165	165
California Ave On Ramp to SR58 EB/Stockdale Hwy Off Ramp	181	200	201	200	200	199	200	200	200	200	200	202	198	199	200	199	199	199	200	202	203	207	211	217	218	200	196	195	195	194	194	193	193
SR58 EB/Stockdale Hwy Off Ramp to SR58 WB On Ramp	220	240	241	240	240	239	240	240	241	240	242	238	239	240	239	239	239	240	242	243	247	251	257	258	240	236	235	235	234	234	233	233	
SR58 WB On Ramp to Real Rd On Ramp	224	245	246	245	245	244	245	245	245	245	245	247	243	244	245	244	244	244	245	247	248	252	256	262	263	245	241	240	240	239	239	238	238
Real Rd On Ramp to Ming Ave Off Ramp	245	269	269	269	268	268	268	268	269	268	268	270	267	267	269	268	268	268	268	270	272	275	280	285	287	268	265	263	263	262	262	261	261
Ming Ave Off Ramp to Ming Ave On Ramp	278	303	304	303	303	302	303	303	303	303	303	305	301	302	303	302	302	302	303	305	306	310	315	320	322	303	299	298	298	297	296	295	296
Ming Ave On Ramp to White Ln Off Ramp	335	364	364	364	363	363	363	364	364	363	363	365	362	362	364	363	362	363	363	365	367	371	376	382	385	363	359	358	357	356	356	354	355
White Ln Off Ramp to White Ln Loop On Ramp	353	383	384	383	382	382	382	383	383	382	383	385	381	381	383	382	381	382	382	384	387	390	395	401	404	382	378	377	376	375	375	373	374
White Ln Loop On Ramp to White Ln Direct On Ramp	363	392	393	393	392	392	392	392	392	392	392	393	391	391	393	391	391	391	392	394	396	400	405	411	414	392	388	387	386	385	385	383	384
White Ln Direct On Ramp to SR99 SB south end of the network	413	444	445	444	444	444	444	444	445	444	446	442	443	444	443	443	443	443	444	446	448	452	457	462	466	444	439	438	437	436	435	435	435
% Difference against Free Flow	-	8%	8%	8%	7%	7%	7%	8%	8%	8%	8%	8%	7%	7%	8%	7%	7%	8%	8%	9%	9%	11%	12%	13%	7%	6%	6%	6%	6%	6%	5%	5%	
SR58 EB Mainline																																	
SR58 west end of the network to SR99 On Ramp	37	43	44	44	44	44	44	44	44	44	44	44	44	44	43	44	44	44	44	45	45	46	46	47	47	44	43	43	43	42	42	42	42
SR99 On Ramp to H St Off Ramp	46	54	54	54	55	54	55	55	54	54	54	55	55	54	54	54	55	54	56	56	56	56	57	58	54	53	53	52	53	52	52	52	
H St Off Ramp to Chester Ave On Ramp	80	92	92	91	93	92	92	92	92	92	93	92	92	92	91	92	91	93	92	94	94	94	95	99	97	92	91	91	90	90	89	90	89
Chester Ave On Ramp to Union Ave Off Ramp	106	122	123	121	124	122	123	123	123	123	124	123	123	122	122	122	122	121	124	122	125	126	128	128	139	135	122	121	120	119	119	118	117
Union Ave Off Ramp to Union Ave Loop On Ramp	122	140	140	139	141	140	140	140	140	140	141	140	140	140	139	140	138	141	139	142	143	145	145	157	153	139	138	137	136	136	136	135	134
Union Ave Loop On Ramp to Union Ave Direct On Ramp	130	148	148	147	150	148	149	148	148	148	149	148	149	148	147	148	147	149	148	151	152	154	154	166	161	148	146	146	144	144	144	143	143
Union Ave Direct On Ramp to SR58 east end of the network	198	222	223	221	224	223	223	223	223	223	224	223	223	223	222	223	221	224	223	226	227	229	229	242	237	222	220	220	220	218	218	217	216
% Difference against Free Flow	-	12%	12%	12%	13%	12%	13%	12%	12%	12%	13%	12%	12%	12%	12%	12%	13%	12%	14%	15%	16%	22%	20%	12%	11%	11%	10%	10%	10%	9%	9%	9%	
SR58 WB Mainline																																	
SR58 east end of the network to Brundage Ln Off Ramp	65	68	69	69	69	70	68	69	68	68	68	69	68	68	68	68	68	68	68	68	69	69	69	70	68	68	68	68	68	68	67	67	
Brundage Ln Off Ramp to Brundage Ln On Ramp	81	86	86	86	86	87	86	86	86	86	86	86	85	86	85	85	86	85	86	86	86	86	87	87	85	85	85	85	85	85	84	85	
Brundage Ln On Ramp to Union Ave On Ramp	93	98	98	99	99	100	98	98	98	98	98	98	98	98	98	98	98	98	98	98	98	99	99	100	98	97	97	97	97	97	97	97	
Union Ave On Ramp to Chester Ave Off Ramp	114	122	122	123	123	124	122	123	122	122	122	122	122	122	122	122	122	122	122	123	124	124	124	126	122	121	121	121	121	120	120	120	
Chester Ave Off Ramp to H St On Ramp	152	162	162	163	162	164	162	163	162	162	162	162	162	162	162	162	161	162	162	162	162	164	164	166	161	161	160	160	160	160	160	160	
H St On Ramp to SR99 NB Off Ramp	176	191	190	192	191	192	190	191	190	190	190	190	190	190	190	190	189	190	190	190	191	193	193	194	197	190	188	188	188	187	187	187	
SR99 NB Off Ramp to SR99 SB Off Ramp	199	218	217	219	217	219	217	218	216	216	217	218	217	217	217	217	216	216	216	217	218	220</											

CORSIM ANALYSIS RESULTS - AM PEAK

Freeway Segment	CFS	PCFC	PCFC	PCFC	PCFC	PCFC	PCFC	PCFC	PCFC	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS
	-90%	-10%	-20%	-30%	-40%	-50%	-60%	-70%	-10%	+10%	+10%	+10%	+30%	+10%	-10%	-10%	-10%	-30%	-30%	-30%	-30%
	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
SR99 NB Mainline																					
Ming Ave Off Ramp to Ming Ave On Ramp	181	202	202	200	204	191	194	194	206	202	202	293	192	190	186	186	184	183	182	181	181
Ming Ave On Ramp to SR58 EB/Wible Rd Off Ramp	197	223	223	221	225	211	215	214	227	222	223	314	212	210	205	205	202	201	200	198	198
SR58 EB/Wible Rd Off Ramp to Wible Rd On Ramp	229	255	255	253	257	243	247	246	260	255	256	347	244	243	237	237	234	233	232	230	230
Wible Rd On Ramp to SR58 WB On Ramp	238	265	265	263	266	253	256	256	269	264	265	357	254	252	246	247	243	243	241	239	240
SR58 WB On Ramp to California Ave Off Ramp	273	302	301	299	303	290	293	292	307	302	302	395	290	288	282	284	279	278	277	275	275
California Ave Off Ramp to California Ave Loop On Ramp	290	319	317	316	319	306	310	309	323	319	319	417	306	304	298	300	295	295	293	291	291
California Ave Loop On Ramp to California Ave Direct On Ramp	299	328	327	325	329	315	319	318	334	328	328	440	316	314	307	310	305	304	302	300	300
California Ave Direct On Ramp to Rosedale Hwy Off Ramp	323	360	360	356	356	344	348	348	370	362	356	482	345	342	334	338	331	328	328	324	325
Rosedale Hwy Off Ramp to Buck Owens Blvd/Sillect Ave Off Ramp	339	376	376	372	372	360	364	364	387	379	373	499	361	358	350	354	347	344	344	340	341
Buck Owens Blvd/Sillect Ave Off Ramp to Buck Owens Blvd/Sillect Ave On Ramp	372	409	410	405	406	394	398	397	420	412	406	532	395	391	383	387	380	377	377	373	374
Buck Owens Blvd/Sillect Ave On Ramp to Airport Dr Off Ramp	405	443	444	439	440	428	431	431	455	446	440	567	429	425	417	421	413	410	410	407	407
Airport Dr Off Ramp to SR99 NB north end of the network	445	484	484	480	480	468	472	472	495	487	480	607	469	465	457	461	454	450	450	447	448
% Difference against Free Flow	8%	18%	18%	17%	17%	14%	15%	0	21%	19%	17%	48%	14%	13%	11%	12%	11%	10%	10%	9%	9%
SR99 SB Mainline																					
SR99 SB north end of the network to Airport Dr On Ramp	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48	48
Airport Dr On Ramp to Rosedale Hwy Off Ramp	80	81	82	81	81	81	81	81	81	82	81	83	81	81	81	81	81	81	80	81	80
Rosedale Hwy Off Ramp to Rosedale Hwy Loop On Ramp	105	106	106	106	106	106	106	106	106	107	106	108	106	106	106	106	106	106	105	105	105
Rosedale Hwy Loop On Ramp to Rosedale Hwy Direct On Ramp	118	120	120	120	120	120	119	120	120	120	120	122	120	120	120	120	120	119	118	119	119
Rosedale Hwy Direct On Ramp to California Ave Off Ramp	151	156	158	157	156	156	155	155	158	158	157	163	157	155	155	155	153	153	152	152	152
California Ave Off Ramp to California Ave On Ramp	165	170	171	170	170	170	168	169	171	171	170	176	170	169	168	168	167	166	166	165	165
California Ave On Ramp to SR58 EB/Stockdale Hwy Off Ramp	192	199	200	199	198	198	197	197	200	200	199	206	199	199	197	196	195	194	194	194	193
SR58 EB/Stockdale Hwy Off Ramp to SR58 WB On Ramp	232	239	240	239	238	238	237	238	240	240	239	246	239	238	236	236	235	234	234	234	233
SR58 WB On Ramp to Real Rd On Ramp	237	243	245	244	243	243	242	242	245	245	244	251	244	242	242	241	240	239	239	239	238
Real Rd On Ramp to Ming Ave Off Ramp	260	266	269	267	267	266	265	266	269	269	268	275	267	266	265	264	263	263	262	261	261
Ming Ave Off Ramp to Ming Ave On Ramp	294	301	304	301	301	301	300	300	303	303	302	310	302	300	299	299	297	298	296	296	296
Ming Ave On Ramp to White Ln Off Ramp	353	361	364	361	362	361	360	361	364	364	363	371	362	361	359	359	357	358	356	355	355
White Ln Off Ramp to White Ln Loop On Ramp	373	380	384	381	381	380	379	380	383	384	382	390	381	380	379	378	376	377	375	374	374
White Ln Loop On Ramp to White Ln Direct On Ramp	382	390	393	390	391	390	389	390	393	393	392	399	391	390	388	387	386	387	385	384	384
White Ln Direct On Ramp to SR99 SB south end of the network	434	442	445	442	442	442	440	441	445	445	444	451	443	441	440	439	438	438	436	436	436
% Difference against Free Flow	5%	7%	8%	7%	7%	7%	7%	0	8%	8%	7%	9%	7%	7%	7%	6%	6%	6%	6%	6%	6%
SR58 EB Mainline																					
SR58 west end of the network to SR99 On Ramp	42	44	44	44	44	44	43	44	44	45	44	46	43	43	43	43	43	42	42	42	43
SR99 On Ramp to H St Off Ramp	52	54	55	54	54	54	54	54	55	55	54	56	53	54	53	53	53	53	52	53	53
H St Off Ramp to Chester Ave On Ramp	89	92	92	92	92	91	92	91	92	93	92	95	91	91	91	90	90	90	89	90	90
Chester Ave On Ramp to Union Ave Off Ramp	117	122	122	122	122	121	122	121	123	124	122	128	120	121	121	119	119	119	118	119	118
Union Ave Off Ramp to Union Ave Loop On Ramp	134	140	139	139	139	138	139	138	140	141	139	146	137	138	138	136	136	136	135	136	135
Union Ave Loop On Ramp to Union Ave Direct On Ramp	143	148	148	148	148	147	148	147	149	150	148	154	146	147	146	145	144	145	143	144	144
Union Ave Direct On Ramp to SR58 east end of the network	216	223	222	222	222	221	223	221	223	224	222	229	220	221	220	219	218	219	217	218	217
% Difference against Free Flow	9%	12%	12%	12%	12%	12%	12%	0	12%	13%	12%	15%	11%	11%	11%	10%	10%	10%	9%	10%	10%
SR58 WB Mainline																					
SR58 east end of the network to Brundage Ln Off Ramp	67	68	68	68	68	68	68	68	69	69	68	69	68	68	68	68	68	68	68	68	68
Brundage Ln Off Ramp to Brundage Ln On Ramp	84	85	85	85	85	85	85	85	86	86	86	86	86	85	85	85	85	85	85	85	85
Brundage Ln On Ramp to Union Ave On Ramp	96	98	98	98	98	98	98	98	98	98	98	99	98	97	98	97	97	97	97	97	97
Union Ave On Ramp to Chester Ave Off Ramp	120	122	122	122	122	121	121	122	123	123	122	124	122	121	122	121	121	121	121	121	121
Chester Ave Off Ramp to H St On Ramp	159	162	161	161	162	161	161	161	163	163	162	164	162	161	162	161	161	161	160	160	160
H St On Ramp to SR99 NB Off Ramp	187	190	189	189	190	189	189	189	191	191	189	193	190	189	189	188	188	188	187	187	187
SR99 NB Off Ramp to SR99 SB Off Ramp	213	216	216	216	216	216	216	216	218	218	216	220	216	215	216	215	215	215	214	214	214
% Difference against Free Flow	7%	9%	8%	8%	9%	8%	8%	9%	9%	10%	8%	10%	9%	8%	8%	8%	8%	7%	7%	7%	7%

CENTENNIAL EXISTING CONDITIONS: Calibration Results Comparision - SPEED (MPH)
CORSIM ANALYSIS RESULTS - PM PEAK

Freeway Segment	F&P Analysis	Default (Constant Headway)	Normal	Erlang1	Erlang2	Erlang3	Erlang4	Erlang5	Erlang6	Erlang7	Erlang8	Erlang9	CFS -1%+1%	CFS -2%+2%	CFS -3%+3%	CFS -4%+4%	CFS -5%+5%	CFS -6%+6%	CFS -7%+7%	CFS +10%	CFS +20%	CFS +30%	CFS +40%	CFS +50%	CFS +60%	CFS -10%	CFS -20%	CFS -30%	CFS -40%	CFS -50%	CFS -60%	CFS -70%
SR-99 NB Mainline																																
SR-99 NB south end of the network to White Ln Off Ramp	65	64	64	63	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
White Ln Off Ramp to White Ln Loop On Ramp	65	63	63	63	63	63	63	63	63	63	63	63	63	63	63	64	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	64
White Ln Loop On Ramp to White Ln Direct On Ramp	-	52	52	50	53	51	51	51	51	53	50	53	51	51	52	52	51	51	52	52	53	52	51	53	52	52	51	53	53	53	52	53
White Ln Direct On Ramp to Ming Ave Off Ramp	65	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	60	60	60	61	61	61	61	61	62	62
Ming Ave Off Ramp to Ming Ave On Ramp	65	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	61	62	62	62	62	62	63	63
Ming Ave On Ramp to SR58 EB/Wible Rd Off Ramp	-	47	46	44	46	47	48	46	46	46	48	45	46	46	47	46	47	49	47	42	43	41	37	37	49	49	52	50	52	52	52	52
SR58 EB/Wible Rd Off Ramp to Wible Rd On Ramp	65	63	62	63	63	63	63	63	63	63	63	63	63	63	63	63	62	62	62	63	62	62	62	56	63	63	63	63	63	63	63	63
Wible Rd On Ramp to SR58 WB On Ramp	-	59	59	59	59	59	59	60	59	59	59	60	59	59	59	59	59	59	59	59	59	59	59	27	59	59	59	59	59	59	60	60
SR58 WB On Ramp to California Ave Off Ramp	65	58	57	58	58	59	59	58	58	58	58	58	58	58	57	58	58	58	58	57	57	57	57	24	59	58	59	59	59	59	59	59
California Ave Off Ramp to California Ave Loop On Ramp	65	62	62	62	62	63	62	63	62	62	62	63	63	62	62	62	62	63	62	63	62	62	62	11	62	63	63	62	62	62	62	62
California Ave Loop On Ramp to California Ave Direct On Ramp	-	55	57	54	55	55	55	56	56	53	55	56	56	56	56	56	56	56	55	55	54	53	39	9	56	55	56	57	57	57	57	57
California Ave Direct On Ramp to Rosedale Hwy Off Ramp	65	51	52	51	51	51	51	51	51	46	51	52	52	50	50	51	51	52	52	49	48	46	43	39	21	53	53	55	55	56	57	57
Rosedale Hwy Off Ramp to Buck Owens Blvd/Sillect Ave Off Ramp	-	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	61	62	63	63	62	63	63	63	63
Buck Owens Blvd/Sillect Ave Off Ramp to Buck Owens Blvd/Sillect Ave On Ramp	65	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
Buck Owens Blvd/Sillect Ave On Ramp to Airport Dr Off Ramp	-	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	59	60	59	59	60	60	61	61	61	61	61	61	61
Airport Dr Off Ramp to SR99 NB north end of the network	65	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
SR-99 SB Mainline																																
SR99 SB north end of the network to Airport Dr On Ramp	65	63	63	63	63	63	63	63	63	63	64	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	64	64	64	64	64	64
Airport Dr On Ramp to Rosedale Hwy Off Ramp	65	55	55	53	54	54	55	55	54	55	54	55	54	55	54	55	55	55	55	54	53	50	50	48	47	55	56	55	57	58	58	58
Rosedale Hwy Off Ramp to Rosedale Hwy Loop On Ramp	6	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	57	50	33	29	62	62	62	62	62	62	62
Rosedale Hwy Loop On Ramp to Rosedale Hwy Direct On Ramp	-	48	48	48	48	48	48	45	48	47	45	44	49	48	47	48	50	46	48	50	41	29	23	20	17	15	52	55	55	56	56	57
Rosedale Hwy Direct On Ramp to California Ave Off Ramp	63	45	46	46	44	45	44	46	44	45	45	45	45	44	45	45	44	46	46	42	40	39	33	27	19	47	50	51	53	54	54	55
California Ave Off Ramp to California Ave On Ramp	65	52	52	56	61	56	56	50	56	61	60	61	59	57	57	59	55	60	55	43	44	35	21	15	13	58	61	61	61	61	62	62
California Ave On Ramp to SR58 EB/Stockdale Hwy Off Ramp	63	44	43	44	48	45	45	43	45	46	47	46	45	44	47	47	45	47	44	41	41	40	40	40	40	48	50	52	54	53	56	57
SR58 EB/Stockdale Hwy Off Ramp to SR58 WB On Ramp	65	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	61	61	62	62	62	63	63	63	63	63
SR58 WB On Ramp to Real Rd On Ramp	-	50	49	45	47	49	49	50	47	50	44	46	48	50	47	49	49	46	48	50	48	40	46	39	46	41	49	48	49	49	49	47
Real Rd On Ramp to Ming Ave Off Ramp	-	53	53	49	53	51	54	54	51	54	52	52	54	54	53	54	54	52	53	53	51	48	48	48	49	40	54	54	55	53	54	56
Ming Ave Off Ramp to Ming Ave On Ramp	65	62	63	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	57	62	62	63	63	63	62	62	63	63
Ming Ave On Ramp to White Ln Off Ramp	63	57	49	54	57	54	47	50	56	50	55	28	48	53	53	52	56	51	52	44	51	46	50	31	52	57	52	60	36	60	42	50
White Ln Off Ramp to White Ln Loop On Ramp	65	63	62	62	62	62	61	61	62	62	62	61	61	62	62	61	62	61	62	62	62	62	62	62	62	62	61	63	62	62	61	61
White Ln Loop On Ramp to White Ln Direct On Ramp	-	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
White Ln Direct On Ramp to SR99 SB south end of the network	65	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	63	62	62	62	62	62	62	62	62	62	62	62	62	63	62	63
SR58 EB Mainline																																
SR58 west end of the network to SR99 On Ramp	-	55	54	55	55	55	54	55	55	55	55	55	54	55	55	55	55	55	55	54	54	54	53	52	52	55	55	56	56	56	57	56
SR99 On Ramp to H St Off Ramp	-	58	58	58	58	58	58	58	58	58	58	58	58	58	58	59	58	58	58	58	58	58	58	57	57	58	58	59	59	59	59	59
H St Off Ramp to Chester Ave On Ramp	64	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	59	60	59	59	59	59	58	60	60	60	61	61	61	61
Chester Ave On Ramp to Union Ave Off Ramp	61	55	55	56	56	56	56	56	55	56	56	55	56	56	57	56	56	56	56	55	54	53	53	51	49	57	56	58	58	59	59	59
Union Ave Off Ramp to Union Ave Loop On Ramp	64	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	60	61	60	59	61	61	61	62	61	62	62
Union Ave Loop On Ramp to Union Ave Direct On Ramp	-	58	58	58	58	58	58	58	57	58	58	58	57	58	59	58	58	57	58	58	58	56	58	57	56	58	59	57	59	59	59	59
Union Ave Direct On Ramp to SR58 east end of the network	61	60	59	59	60	60	60	60	59	60	60	60	60	60	60	60	59	60	60	60	59	59	59	58	60	60	60	61	61	61	61	61
SR58 WB Mainline																																
SR58 east end of the network to Brundage Ln Off Ramp	64	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	61	61	62	62	62	62	63	63	63	63
Brundage Ln Off Ramp to Brundage Ln On Ramp	65	61	61	61	61	62	61	61	61	61	61	62	61	61	61	61	62	61	61	61	61	61	61	60	61	62	61	62	62	62	62	62
Brundage Ln On Ramp to Union Ave On Ramp	-	59	59	58	58	59	58	58	59	59	59	59	59	59	59	59	58	59	58	58	58	58	58	57	59	59	59	60	60	60	60	60
Union Ave On Ramp to Chester Ave Off Ramp	-	57	57	57	57	57	57	56	56	57	56	57	57	57	56	56	57	56	57	56	55	5										

Freeway Segment	CFS -80%	CFS -90%	PCFC -10%	PCFC -20%	PCFC -30%	PCFC -40%	PCFC -50%	PCFC -60%	PCFC -70%	CFS +10% PCFC -10%	CFS +10% PCFC -30%	CFS +10% PCFC -50%	CFS +30% PCFC -10%	CFS +10% PCFC -30%	CFS +10% PCFC -50%	CFS +30% PCFC -10%	CFS +30% PCFC -30%	CFS +30% PCFC -50%	CFS +30% PCFC -10%	CFS +30% PCFC -30%	CFS +30% PCFC -50%	CFS +30% PCFC -10%	CFS +30% PCFC -30%	CFS +30% PCFC -50%
SR-99 NB Mainline										Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
SR-99 NB south end of the network to White Ln Off Ramp	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
White Ln Off Ramp to White Ln Loop On Ramp	63	64	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
White Ln Loop On Ramp to White Ln Direct On Ramp	54	52	53	53	52	51	53	53	52	52	52	51	53	52	51	53	52	53	53	53	52	54		
White Ln Direct On Ramp to Ming Ave Off Ramp	62	62	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	62	62	62
Ming Ave Off Ramp to Ming Ave On Ramp	62	63	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	63	62	62
Ming Ave On Ramp to SR58 EB/Wible Rd Off Ramp	54	53	45	46	50	47	48	49	50	47	48	47	41	49	47	50	50	51	53	52	53	53	53	53
SR58 EB/Wible Rd Off Ramp to Wible Rd On Ramp	63	63	62	62	63	63	62	62	63	63	63	62	62	63	63	63	63	63	63	63	63	63	63	63
Wible Rd On Ramp to SR58 WB On Ramp	60	60	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
SR58 WB On Ramp to California Ave Off Ramp	59	60	58	58	59	58	58	58	59	58	58	59	57	59	59	58	59	58	59	59	59	59	59	59
California Ave Off Ramp to California Ave Loop On Ramp	62	62	62	62	63	63	62	62	63	62	62	62	62	62	62	63	63	62	62	62	62	62	63	63
California Ave Loop On Ramp to California Ave Direct On Ramp	57	58	55	56	56	57	56	55	57	54	56	56	54	56	57	56	57	57	56	57	58	57	57	57
California Ave Direct On Ramp to Rosedale Hwy Off Ramp	57	57	51	53	52	53	53	52	54	50	52	52	45	52	53	52	56	56	55	55	56	57	57	57
Rosedale Hwy Off Ramp to Buck Owens Blvd/Sillect Ave Off Ramp	63	63	62	62	62	62	62	62	63	62	62	62	61	62	62	62	63	63	63	62	63	63	63	63
Buck Owens Blvd/Sillect Ave Off Ramp to Buck Owens Blvd/Sillect Ave On Ramp	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
Buck Owens Blvd/Sillect Ave On Ramp to Airport Dr Off Ramp	61	61	60	60	60	60	60	61	61	60	60	60	59	60	60	60	61	61	61	61	61	61	61	61
Airport Dr Off Ramp to SR99 NB north end of the network	64	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
SR-99 SB Mainline																								
SR99 SB north end of the network to Airport Dr On Ramp	64	64	63	64	64	63	64	64	64	63	63	63	63	63	64	64	64	64	64	64	64	64	64	64
Airport Dr On Ramp to Rosedale Hwy Off Ramp	58	58	55	55	55	55	55	56	56	54	54	54	50	54	55	55	56	56	57	56	57	58	58	58
Rosedale Hwy Off Ramp to Rosedale Hwy Loop On Ramp	62	62	62	62	62	62	62	62	62	62	62	62	56	62	62	62	62	62	62	62	62	62	62	62
Rosedale Hwy Loop On Ramp to Rosedale Hwy Direct On Ramp	58	57	53	54	55	54	54	54	54	45	49	50	21	52	56	55	54	56	56	55	57	57	57	57
Rosedale Hwy Direct On Ramp to California Ave Off Ramp	56	56	46	47	47	47	48	48	48	43	45	45	33	47	49	50	51	53	52	54	55	55	55	55
California Ave Off Ramp to California Ave On Ramp	62	61	59	58	61	61	61	60	60	58	59	60	22	59	60	61	60	61	61	60	62	62	62	62
California Ave On Ramp to SR58 EB/Stockdale Hwy Off Ramp	57	57	44	48	48	49	51	47	49	45	45	45	41	48	47	51	52	51	53	52	54	56	56	56
SR58 EB/Stockdale Hwy Off Ramp to SR58 WB On Ramp	63	63	62	62	62	63	62	63	63	62	62	62	61	62	63	63	63	63	63	63	62	63	63	63
SR58 WB On Ramp to Real Rd On Ramp	48	48	49	50	34	47	47	50	49	43	43	50	48	46	50	48	47	47	48	45	49	47	47	47
Real Rd On Ramp to Ming Ave Off Ramp	57	56	55	54	37	50	54	55	54	45	49	53	52	52	55	54	54	55	55	55	54	53	53	53
Ming Ave Off Ramp to Ming Ave On Ramp	63	63	63	62	62	62	63	63	63	62	62	62	62	62	63	62	63	63	63	63	62	62	62	62
Ming Ave On Ramp to White Ln Off Ramp	50	61	55	58	55	55	50	58	58	54	45	44	30	42	58	50	47	46	48	53	56	59	59	59
White Ln Off Ramp to White Ln Loop On Ramp	62	63	62	63	62	62	61	62	63	62	61	61	61	61	63	61	61	62	61	62	62	62	62	62
White Ln Loop On Ramp to White Ln Direct On Ramp	62	62	62	62	62	62	62	62	62	62	62	61	62	62	62	61	62	62	62	62	62	62	62	62
White Ln Direct On Ramp to SR99 SB south end of the network	63	62	62	62	63	62	62	62	62	62	62	62	62	62	62	62	62	63	63	62	63	63	63	63
SR58 EB Mainline																								
SR58 west end of the network to SR99 On Ramp	56	56	54	55	55	55	55	55	55	55	55	55	54	55	55	55	56	55	56	56	56	56	56	56
SR99 On Ramp to H St Off Ramp	59	59	57	58	58	58	58	58	58	58	58	58	58	58	58	59	59	59	59	59	58	59	59	59
H St Off Ramp to Chester Ave On Ramp	61	61	59	60	60	60	60	60	60	60	60	60	60	60	60	61	60	61	61	60	61	61	61	61
Chester Ave On Ramp to Union Ave Off Ramp	59	59	55	56	56	56	56	56	57	55	55	55	53	56	56	57	58	58	58	58	59	59	59	59
Union Ave Off Ramp to Union Ave Loop On Ramp	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	62	61	61	61	61	61	62	62	62
Union Ave Loop On Ramp to Union Ave Direct On Ramp	59	59	58	58	58	59	58	58	57	58	57	58	58	59	59	59	58	59	60	59	60	60	60	60
Union Ave Direct On Ramp to SR58 east end of the network	61	61	60	60	60	60	60	60	60	59	60	59	59	60	60	60	60	60	60	60	61	61	61	61
SR58 WB Mainline																								
SR58 east end of the network to Brundage Ln Off Ramp	63	63	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	63	63	63	63	63	63	63
Brundage Ln Off Ramp to Brundage Ln On Ramp	62	62	62	62	61	61	61	62	62	61	61	61	61	62	62	62	62	62	62	62	62	62	62	62
Brundage Ln On Ramp to Union Ave On Ramp	60	61	59	59	59	58	59	59	59	59	59	58	58	58	59	60	60	59	59	60	60	60	60	60
Union Ave On Ramp to Chester Ave Off Ramp	59	59	57	57	57	57	57	57	57	57	56	56	56	56	57	58	58	58	58	59	59	59	59	59
Chester Ave Off Ramp to H St On Ramp	62	62	61	61	61	61	61	61	61	61	61	61	61	61	61	62	61	62	61	62	62	62	62	62
H St On Ramp to SR99 NB Off Ramp	59	59	57	57	56	57	57	56	56	56	55	56	54	56	57	57	57	57	58	58	58	57	57	57
SR99 NB Off Ramp to SR99 SB Off Ramp	57	57	57	57	57	57	57	57	57	57	57	56	57	57	57	57	57	57	57	57	57	57	57	57

CENTENNIAL EXISTING CONDITIONS: Calibration Results Comparision - Density (Vehicle/Lane/Mile)
CORSIM ANALYSIS RESULTS - PM PEAK

Freeway Segment	F&P Analysis	Default (Constant Headway)	Normal	Erlang1	Erlang2	Erlang3	Erlang4	Erlang5	Erlang6	Erlang7	Erlang8	Erlang9	CFS -1%+1%	CFS -2%+2%	CFS -3%+3%	CFS -4%+4%	CFS -5%+5%	CFS -6%+6%	CFS -7%+7%	CFS +10%	CFS +20%	CFS +30%	CFS +40%	CFS +50%	CFS +60%	CFS -10%	CFS -20%	CFS -30%	CFS -40%	CFS -50%	CFS -60%	CFS -70%
SR-99 NB Mainline																																
SR-99 NB south end of the network to White Ln Off Ramp	15	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	
White Ln Off Ramp to White Ln Loop On Ramp	13	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	
White Ln Loop On Ramp to White Ln Direct On Ramp	-	18	18	18	17	18	18	18	18	17	19	17	18	18	18	18	18	18	18	17	17	18	18	17	18	18	18	17	17	18	18	
White Ln Direct On Ramp to Ming Ave Off Ramp	22	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	
Ming Ave Off Ramp to Ming Ave On Ramp	15	13	13	13	14	13	13	13	14	13	14	13	14	14	14	13	14	13	13	13	13	13	13	14	14	13	14	13	13	13	13	
Ming Ave On Ramp to SR58 EB/Wible Rd Off Ramp	-	22	22	23	22	21	20	22	22	22	21	22	22	22	21	22	21	22	20	21	24	24	24	27	27	20	21	19	20	19	19	
SR58 EB/Wible Rd Off Ramp to Wible Rd On Ramp	14	13	12	13	12	13	12	12	12	13	13	12	13	13	12	12	13	12	13	12	12	13	13	14	13	14	13	12	13	12	12	
Wible Rd On Ramp to SR58 WB On Ramp	-	15	14	14	14	15	14	14	14	15	14	14	15	15	14	14	15	14	14	14	14	15	14	27	14	14	15	14	15	14	15	
SR58 WB On Ramp to California Ave Off Ramp	21	21	21	20	20	20	20	20	20	21	20	20	20	20	21	21	20	21	20	21	20	21	21	21	43	20	20	20	20	20	20	
California Ave Off Ramp to California Ave Loop On Ramp	18	17	16	17	16	17	17	17	16	17	17	16	17	16	17	16	17	16	17	16	16	16	16	16	80	16	16	16	16	17	17	
California Ave Loop On Ramp to California Ave Direct On Ramp	-	20	19	20	19	20	20	19	19	20	20	19	19	19	19	19	19	19	20	19	19	19	20	27	84	19	19	19	19	19	19	
California Ave Direct On Ramp to Rosedale Hwy Off Ramp	22	24	22	23	23	23	24	23	23	26	23	22	23	23	23	23	24	22	23	24	24	25	27	30	44	22	22	21	21	21	20	
Rosedale Hwy Off Ramp to Buck Owens Blvd/Sillect Ave Off Ramp	-	13	13	13	13	13	13	13	13	12	13	12	13	13	13	13	13	12	13	12	13	13	13	13	10	12	13	13	12	13	13	
Buck Owens Blvd/Sillect Ave Off Ramp to Buck Owens Blvd/Sillect Ave On Ramp	14	11	11	12	11	11	12	11	11	11	12	11	11	11	11	11	11	11	12	11	11	11	12	12	9	11	11	12	11	11	11	
Buck Owens Blvd/Sillect Ave On Ramp to Airport Dr Off Ramp	-	14	14	14	13	13	14	13	13	13	13	14	13	13	13	14	13	14	13	14	13	14	14	11	13	13	14	13	13	13	13	
Airport Dr Off Ramp to SR99 NB north end of the network	14	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	9	10	10	10	10	8	9	9	10	10	10	10	
SR-99 SB Mainline																																
SR99 SB north end of the network to Airport Dr On Ramp	20	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	
Airport Dr On Ramp to Rosedale Hwy Off Ramp	23	22	22	23	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	23	24	25	26	26	22	22	22	21	21	21	
Rosedale Hwy Off Ramp to Rosedale Hwy Loop On Ramp	20	18	17	18	17	17	17	17	18	17	17	18	17	17	17	17	17	17	17	17	18	19	21	32	36	17	17	17	17	17	17	
Rosedale Hwy Loop On Ramp to Rosedale Hwy Direct On Ramp	-	26	26	26	26	26	28	26	26	28	28	26	26	26	26	25	27	26	25	31	43	54	62	69	74	24	23	23	22	23	22	
Rosedale Hwy Direct On Ramp to California Ave Off Ramp	31	37	36	36	37	36	38	36	37	37	37	37	37	37	37	36	37	36	36	39	42	43	48	55	69	35	33	32	31	30	30	
California Ave Off Ramp to California Ave On Ramp	25	27	27	25	23	25	25	29	25	23	23	23	24	25	24	24	25	24	26	33	32	39	63	88	90	24	23	23	23	23	23	
California Ave On Ramp to SR58 EB/Stockdale Hwy Off Ramp	29	37	37	37	32	35	36	38	36	34	34	34	35	36	34	33	35	34	36	40	40	40	41	40	37	33	32	30	29	28	28	
SR58 EB/Stockdale Hwy Off Ramp to SR58 WB On Ramp	20	18	18	18	18	18	18	18	18	18	19	18	18	18	18	18	18	18	18	18	18	19	18	18	16	19	18	18	18	18	18	
SR58 WB On Ramp to Real Rd On Ramp	-	23	23	25	24	23	23	23	24	23	26	25	24	23	25	24	23	25	24	23	24	23	24	28	24	28	22	28	24	24	23	
Real Rd On Ramp to Ming Ave Off Ramp	-	26	26	28	26	27	25	26	27	25	27	27	26	26	27	26	25	27	26	26	27	29	27	28	25	35	26	26	25	26	25	
Ming Ave Off Ramp to Ming Ave On Ramp	20	18	17	18	17	17	18	18	17	17	18	18	18	18	18	18	17	18	17	18	18	17	17	18	16	17	18	17	17	18	18	
Ming Ave On Ramp to White Ln Off Ramp	31	25	30	26	25	27	33	30	25	28	26	56	32	27	28	28	25	29	28	33	29	32	29	47	25	25	29	24	44	23	40	
White Ln Off Ramp to White Ln Loop On Ramp	18	15	15	16	15	15	15	16	15	15	16	15	15	15	15	16	15	16	15	15	16	15	15	14	14	15	15	16	15	15	15	
White Ln Loop On Ramp to White Ln Direct On Ramp	-	15	14	15	14	14	14	15	15	14	15	14	14	14	14	15	14	15	14	14	15	14	14	13	13	14	14	15	14	14	14	
White Ln Direct On Ramp to SR99 SB south end of the network	191	16	15	16	16	16	16	16	16	15	16	15	16	16	16	16	16	16	16	15	16	16	15	14	15	15	16	16	15	16	15	
SR58 EB Mainline																																
SR58 west end of the network to SR99 On Ramp	-	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
SR99 On Ramp to H St Off Ramp	-	20	20	20	19	19	19	20	20	19	19	20	20	20	20	19	20	20	20	20	20	20	19	19	19	20	20	19	19	19	20	
H St Off Ramp to Chester Ave On Ramp	27	21	22	21	21	21	21	21	22	21	21	21	21	21	21	21	21	21	21	21	22	21	21	21	20	21	22	21	20	21	21	
Chester Ave On Ramp to Union Ave Off Ramp	34	31	32	31	31	30	31	31	32	30	30	31	31	31	30	30	31	30	31	31	32	32	32	32	33	30	32	30	29	29	29	
Union Ave Off Ramp to Union Ave Loop On Ramp	27	25	26	25	25	25	25	26	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	25	25	26	25	25	25	25	
Union Ave Loop On Ramp to Union Ave Direct On Ramp	-	24	24	24	23	23	23	23	24	23	23	23	24	23	23	23	23	24	24	23	24	24	23	23	23	23	23	24	22	23	23	
Union Ave Direct On Ramp to SR58 east end of the network	33	29	29	29	29	29	29	28	29	29	28	29	29	29	28	28	28	29	29	29	29	29	28	28	28	28	29	28	27	28	28	
SR58 WB Mainline																																
SR58 east end of the network to Brundage Ln Off Ramp	27	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	24	24	
Brundage Ln Off Ramp to Brundage Ln On Ramp	24	23	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	23	22	22	22	22	22	22	
Brundage Ln On Ramp to Union Ave On Ramp	-	22	22	22	22	22	23	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	23	22	22	22	22	22	21	
Union Ave On Ramp to Chester Ave Off Ramp	-	27	27	27	27	27	27	27	27	27	27	27	26	27	27	27	27	27	27	27	27	28	28	28	30	27	27	26	26	26	26	
Chester Ave Off Ramp to H St On Ramp	25	24	23	23	23	23	24	23	23	23	23	23	23	23	24	23	23	23	23	23	23	23	23	23	24	23	23	23	23	23	23	
H St On Ramp to SR99 NB Off Ramp	29	28	28	28	28	28	29	28</																								

Freeway Segment	CFS	CFS	PCFC	PCFC	PCFC	PCFC	PCFC	PCFC	PCFC	PCFC	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS	CFS
	-80%	-90%	-10%	-20%	-30%	-40%	-50%	-60%	-70%	-10%	+10%	+10%	+10%	+30%	-10%	-10%	-10%	-30%	-30%	-50%	-50%	-50%	-50%	-50%
	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
SR-99 NB Mainline																								
SR-99 NB south end of the network to White Ln Off Ramp	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
White Ln Off Ramp to White Ln Loop On Ramp	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
White Ln Loop On Ramp to White Ln Direct On Ramp	17	17	17	17	18	18	18	18	17	18	18	17	18	17	18	18	18	17	17	17	17	18	17	17
White Ln Direct On Ramp to Ming Ave Off Ramp	18	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Ming Ave Off Ramp to Ming Ave On Ramp	13	13	13	14	14	14	14	14	14	13	13	13	13	14	13	13	13	13	13	13	13	13	13	13
Ming Ave On Ramp to SR58 EB/Wible Rd Off Ramp	19	19	22	22	20	21	21	21	20	21	21	22	24	20	21	20	20	20	20	19	19	19	19	19
SR58 EB/Wible Rd Off Ramp to Wible Rd On Ramp	12	13	13	13	12	13	13	12	12	12	12	12	12	13	13	12	13	12	12	13	12	13	12	13
Wible Rd On Ramp to SR58 WB On Ramp	14	15	15	15	14	15	15	15	15	14	14	15	14	15	15	14	15	14	14	15	15	15	15	14
SR58 WB On Ramp to California Ave Off Ramp	20	20	20	21	20	21	21	20	20	20	20	20	20	21	20	20	20	20	20	20	20	20	20	20
California Ave Off Ramp to California Ave Loop On Ramp	16	17	17	17	16	17	17	16	16	16	16	16	16	17	16	17	16	16	17	16	16	16	16	16
California Ave Loop On Ramp to California Ave Direct On Ramp	19	19	20	19	19	19	20	19	18	19	19	19	20	19	19	19	19	19	18	19	19	19	19	19
California Ave Direct On Ramp to Rosedale Hwy Off Ramp	21	21	23	23	22	23	23	23	22	23	22	23	22	26	23	22	23	21	20	22	21	21	20	20
Rosedale Hwy Off Ramp to Buck Owens Blvd/Sillect Ave Off Ramp	12	13	13	13	13	13	13	13	12	12	13	13	13	13	13	13	13	13	13	13	13	12	13	13
Buck Owens Blvd/Sillect Ave Off Ramp to Buck Owens Blvd/Sillect Ave On Ramp	11	11	11	11	11	12	12	11	11	11	11	11	11	12	12	11	11	11	11	11	11	11	11	11
Buck Owens Blvd/Sillect Ave On Ramp to Airport Dr Off Ramp	13	13	14	13	13	14	14	13	13	13	13	14	14	14	14	13	13	13	13	14	13	13	13	13
Airport Dr Off Ramp to SR99 NB north end of the network	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
SR-99 SB Mainline																								
SR99 SB north end of the network to Airport Dr On Ramp	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Airport Dr On Ramp to Rosedale Hwy Off Ramp	21	21	22	22	22	22	22	22	22	22	23	22	23	25	22	22	22	22	22	21	22	21	21	21
Rosedale Hwy Off Ramp to Rosedale Hwy Loop On Ramp	17	17	17	17	17	17	17	17	17	17	17	17	18	19	17	17	17	17	17	17	18	17	17	17
Rosedale Hwy Loop On Ramp to Rosedale Hwy Direct On Ramp	21	22	24	23	22	23	23	23	23	28	25	25	58	24	22	22	22	23	22	22	23	22	22	22
Rosedale Hwy Direct On Ramp to California Ave Off Ramp	29	29	35	34	35	34	34	34	34	38	36	37	49	35	33	33	32	31	31	30	29	29	29	29
California Ave Off Ramp to California Ave On Ramp	23	23	24	24	23	23	23	24	23	24	24	24	63	24	24	23	23	23	23	24	23	23	23	23
California Ave On Ramp to SR58 EB/Stockdale Hwy Off Ramp	27	28	36	33	32	32	30	34	31	35	36	36	41	32	34	30	30	31	29	30	29	28	28	28
SR58 EB/Stockdale Hwy Off Ramp to SR58 WB On Ramp	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
SR58 WB On Ramp to Real Rd On Ramp	24	24	23	23	33	24	25	23	23	27	27	23	24	25	23	24	24	24	24	26	23	24	24	24
Real Rd On Ramp to Ming Ave Off Ramp	24	25	25	26	37	27	26	25	25	31	28	26	26	27	25	26	25	25	25	26	25	26	25	26
Ming Ave Off Ramp to Ming Ave On Ramp	17	17	18	17	17	17	18	17	17	18	17	17	18	17	18	17	18	17	17	17	18	18	17	17
Ming Ave On Ramp to White Ln Off Ramp	31	23	26	24	25	26	31	24	24	26	35	36	48	39	24	32	33	33	32	28	26	24	24	24
White Ln Off Ramp to White Ln Loop On Ramp	15	15	15	15	15	15	16	15	15	15	15	15	15	14	15	15	16	15	15	15	16	15	15	15
White Ln Loop On Ramp to White Ln Direct On Ramp	14	15	14	15	14	14	15	14	14	14	14	14	14	13	14	14	15	14	14	15	15	15	14	14
White Ln Direct On Ramp to SR99 SB south end of the network	16	16	16	16	15	16	16	16	16	16	16	16	16	15	16	16	16	15	15	15	16	16	16	16
SR58 EB Mainline																								
SR58 west end of the network to SR99 On Ramp	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
SR99 On Ramp to H St Off Ramp	20	20	20	20	20	20	19	20	20	20	20	20	19	20	20	19	20	20	19	20	20	20	20	20
H St Off Ramp to Chester Ave On Ramp	21	21	22	21	22	21	21	22	21	22	21	22	21	22	21	22	21	22	21	22	21	21	21	21
Chester Ave On Ramp to Union Ave Off Ramp	30	29	31	31	31	31	30	31	30	31	31	32	31	30	31	30	30	31	29	30	30	29	29	29
Union Ave Off Ramp to Union Ave Loop On Ramp	26	25	25	25	25	26	25	25	25	25	25	25	26	25	25	26	24	25	25	25	26	25	25	25
Union Ave Loop On Ramp to Union Ave Direct On Ramp	24	23	23	23	24	23	23	24	24	23	23	24	23	23	24	23	23	23	23	24	23	23	23	23
Union Ave Direct On Ramp to SR58 east end of the network	29	28	29	28	29	29	28	29	29	29	28	29	28	28	29	28	28	29	28	29	28	28	28	28
SR58 WB Mainline																								
SR58 east end of the network to Brundage Ln Off Ramp	24	24	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	24	24	24	24
Brundage Ln Off Ramp to Brundage Ln On Ramp	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
Brundage Ln On Ramp to Union Ave On Ramp	21	21	22	22	22	22	22	22	22	22	22	22	22	22	22	21	21	22	22	21	21	21	21	21
Union Ave On Ramp to Chester Ave Off Ramp	26	26	27	27	27	27	27	27	27	27	27	27	27	27	27	26	26	27	26	26	26	26	26	26
Chester Ave Off Ramp to H St On Ramp	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
H St On Ramp to SR99 NB Off Ramp	27	26	27	27	28	28	28	28	28	28	28	28	28	29	28	27	27	27	28	27	27	27	27	27
SR99 NB Off Ramp to SR99 SB Off Ramp	19	19	19	19	20	19	20	20	20	20	20	20	19	19	19	19	20	20	19	20	19	19	19	19

Freeway Segment	F&P Analysis	Default (Constant Headway)	Normal	Erlang1	Erlang2	Erlang3	Erlang4	Erlang5	Erlang6	Erlang7	Erlang8	Erlang9	CFS -1%+1%	CFS -2%+2%	CFS -3%+3%	CFS -4%+4%	CFS -5%+5%	CFS -6%+6%	CFS -7%+7%	CFS +10%	CFS +20%	CFS +30%	CFS +40%	CFS +50%	CFS +60%	CFS -10%	CFS -20%	CFS -30%	CFS -40%	CFS -50%	CFS -60%	CFS -70%	CFS -80%	CFS -90%
SR-99 NB Mainline																																		
SR-99 NB south end of the network to White Ln Off Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
White Ln Off Ramp to White Ln Loop On Ramp	B	B	B	B	B	B	B	B	B	B	A	B	B	B	B	A	B	B	B	A	B	B	B	B	B	B	A	B	B	B	B	A	A	
White Ln Loop On Ramp to White Ln Direct On Ramp	-	B	B	B	B	C	C	C	C	B	C	B	B	C	B	B	B	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
White Ln Direct On Ramp to Ming Ave Off Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
Ming Ave Off Ramp to Ming Ave On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Ming Ave On Ramp to SR58 EB/Wible Rd Off Ramp	-	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D	D	C	C	C	C	C	C	C	C	
SR58 EB/Wible Rd Off Ramp to Wible Rd On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Wible Rd On Ramp to SR58 WB On Ramp	-	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	D	B	B	B	B	B	B	B	B	B	
SR58 WB On Ramp to California Ave Off Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E	C	C	C	C	C	C	C	C	C	
California Ave Off Ramp to California Ave Loop On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	F	B	B	B	B	B	B	B	B	B	
California Ave Loop On Ramp to California Ave Direct On Ramp	-	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D	F	C	C	C	C	C	C	C	C	C	
California Ave Direct On Ramp to Rosedale Hwy Off Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D	D	E	C	C	C	C	C	C	C	C	C	
Rosedale Hwy Off Ramp to Buck Owens Blvd/Sillect Ave Off Ramp	-	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	B	
Buck Owens Blvd/Sillect Ave Off Ramp to Buck Owens Blvd/Sillect Ave On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	A	B	B	B	B	A	B	B	B	B	B	B	B	B	B	
Buck Owens Blvd/Sillect Ave On Ramp to Airport Dr Off Ramp	-	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	A	B	B	B	B	B	B	B	B	B	
Airport Dr Off Ramp to SR99 NB north end of the network	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	
SR-99 SB Mainline																																		
SR99 SB north end of the network to Airport Dr On Ramp	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	
Airport Dr On Ramp to Rosedale Hwy Off Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	D	C	C	C	C	C	C	C	C	C	
Rosedale Hwy Off Ramp to Rosedale Hwy Loop On Ramp	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	D	E	B	B	B	B	B	B	B	B	B	
Rosedale Hwy Loop On Ramp to Rosedale Hwy Direct On Ramp	-	D	C	C	D	C	D	D	D	D	D	C	D	D	C	D	C	D	C	D	E	F	F	F	F	C	C	C	C	C	C	C	C	
Rosedale Hwy Direct On Ramp to California Ave Off Ramp	D	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	F	F	F	F	C	C	C	C	C	C	C	C	C
California Ave Off Ramp to California Ave On Ramp	C	D	D	C	C	C	C	D	C	C	C	C	C	C	C	C	C	C	C	D	D	E	F	F	F	C	C	C	C	C	C	C	C	C
California Ave On Ramp to SR58 EB/Stockdale Hwy Off Ramp	D	E	E	E	D	D	E	E	E	D	D	D	E	D	D	D	E	D	D	E	E	E	E	E	E	D	D	D	D	D	D	D	D	D
SR58 EB/Stockdale Hwy Off Ramp to SR58 WB On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	C	C	C	C	C	B	B	B	C	C	C	C	C	C	C	C	C	
SR58 WB On Ramp to Real Rd On Ramp	-	C	C	C	C	C	C	C	C	C	D	C	C	C	C	C	C	C	C	C	D	C	D	C	D	C	C	C	C	C	C	C	C	C
Real Rd On Ramp to Ming Ave Off Ramp	-	C	D	D	D	D	C	C	D	C	D	D	C	C	D	C	D	C	D	D	D	D	D	D	D	C	C	C	C	C	C	C	C	C
Ming Ave Off Ramp to Ming Ave On Ramp	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B	B	B
Ming Ave On Ramp to White Ln Off Ramp	D	C	D	D	C	D	D	D	C	D	D	F	D	D	C	D	D	C	D	D	D	D	D	F	C	C	D	C	E	C	E	D	D	C
White Ln Off Ramp to White Ln Loop On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
White Ln Loop On Ramp to White Ln Direct On Ramp	-	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
White Ln Direct On Ramp to SR99 SB south end of the network	C	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
SR58 EB Mainline																																		
SR58 west end of the network to SR99 On Ramp	-	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
SR99 On Ramp to H St Off Ramp	-	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
H St Off Ramp to Chester Ave On Ramp	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Chester Ave On Ramp to Union Ave Off Ramp	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Union Ave Off Ramp to Union Ave Loop On Ramp	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Union Ave Loop On Ramp to Union Ave Direct On Ramp	-	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Union Ave Direct On Ramp to SR58 east end of the network	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
SR58 WB Mainline																																		
SR58 east end of the network to Brundage Ln Off Ramp	D	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Brundage Ln Off Ramp to Brundage Ln On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Brundage Ln On Ramp to Union Ave On Ramp	-	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Union Ave On Ramp to Chester Ave Off Ramp	-	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Chester Ave Off Ramp to H St On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C								

Freeway Segment	PCFC -10%	PCFC -20%	PCFC -30%	PCFC -40%	PCFC -50%	PCFC -60%	PCFC -70%	CFS +10% PCFC -10% Normal	CFS +10% PCFC -30% Normal	CFS +10% PCFC -50% Normal	CFS +30% PCFC -10% Normal	CFS -10% PCFC -10% Normal	CFS -10% PCFC -30% Normal	CFS -10% PCFC -50% Normal	CFS -30% PCFC -10% Normal	CFS -30% PCFC -30% Normal	CFS -30% PCFC -50% Normal	CFS -50% PCFC -10% Normal	CFS -50% PCFC -30% Normal	CFS -50% PCFC -50% Normal
SR-99 NB Mainline																				
SR-99 NB south end of the network to White Ln Off Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
White Ln Off Ramp to White Ln Loop On Ramp	B	B	B	B	B	B	A	B	B	A	B	B	B	B	A	A	B	B	B	B
White Ln Loop On Ramp to White Ln Direct On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
White Ln Direct On Ramp to Ming Ave Off Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Ming Ave Off Ramp to Ming Ave On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Ming Ave On Ramp to SR58 EB/Wible Rd Off Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
SR58 EB/Wible Rd Off Ramp to Wible Rd On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Wible Rd On Ramp to SR58 WB On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
SR58 WB On Ramp to California Ave Off Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
California Ave Off Ramp to California Ave Loop On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
California Ave Loop On Ramp to California Ave Direct On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
California Ave Direct On Ramp to Rosedale Hwy Off Ramp	C	C	C	C	C	C	C	C	C	C	D	C	C	C	C	C	C	C	C	C
Rosedale Hwy Off Ramp to Buck Owens Blvd/Sillect Ave Off Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Buck Owens Blvd/Sillect Ave Off Ramp to Buck Owens Blvd/Sillect Ave On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Buck Owens Blvd/Sillect Ave On Ramp to Airport Dr Off Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Airport Dr Off Ramp to SR99 NB north end of the network	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
SR-99 SB Mainline																				
SR99 SB north end of the network to Airport Dr On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Airport Dr On Ramp to Rosedale Hwy Off Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Rosedale Hwy Off Ramp to Rosedale Hwy Loop On Ramp	B	B	B	B	B	B	B	B	B	B	C	B	B	B	B	B	B	B	B	B
Rosedale Hwy Loop On Ramp to Rosedale Hwy Direct On Ramp	C	C	C	C	C	C	C	D	C	C	F	C	C	C	C	C	C	C	C	C
Rosedale Hwy Direct On Ramp to California Ave Off Ramp	E	D	D	D	D	D	D	E	E	E	F	D	D	D	D	D	D	D	D	D
California Ave Off Ramp to California Ave On Ramp	C	C	C	C	C	C	C	C	C	C	F	C	C	C	C	C	C	C	C	C
California Ave On Ramp to SR58 EB/Stockdale Hwy Off Ramp	E	D	D	D	D	D	D	E	E	E	E	D	D	D	D	D	D	D	D	D
SR58 EB/Stockdale Hwy Off Ramp to SR58 WB On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
SR58 WB On Ramp to Real Rd On Ramp	C	C	D	C	C	C	C	D	D	C	C	C	C	C	C	C	C	C	C	C
Real Rd On Ramp to Ming Ave Off Ramp	C	C	E	D	D	C	C	D	D	D	D	C	C	C	C	C	C	C	C	C
Ming Ave Off Ramp to Ming Ave On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
Ming Ave On Ramp to White Ln Off Ramp	D	C	C	C	D	C	C	D	D	E	F	E	C	D	D	D	D	D	C	C
White Ln Off Ramp to White Ln Loop On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
White Ln Loop On Ramp to White Ln Direct On Ramp	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
White Ln Direct On Ramp to SR99 SB south end of the network	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
SR58 EB Mainline																				
SR58 west end of the network to SR99 On Ramp	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
SR99 On Ramp to H St Off Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
H St Off Ramp to Chester Ave On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Chester Ave On Ramp to Union Ave Off Ramp	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
Union Ave Off Ramp to Union Ave Loop On Ramp	C	C	C	C	C	C	C	C	C	C	C	D	C	C	C	C	C	C	C	C
Union Ave Loop On Ramp to Union Ave Direct On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Union Ave Direct On Ramp to SR58 east end of the network	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
SR58 WB Mainline																				
SR58 east end of the network to Brundage Ln Off Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Brundage Ln Off Ramp to Brundage Ln On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Brundage Ln On Ramp to Union Ave On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Union Ave On Ramp to Chester Ave Off Ramp	D	D	D	D	D	D	D	D	D	D	D	D	C	C	C	D	C	C	C	C
Chester Ave Off Ramp to H St On Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
H St On Ramp to SR99 NB Off Ramp	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
SR99 NB Off Ramp to SR99 SB Off Ramp	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C